THE GENERAL PLAN

City of Hollister, California

1976

Prepared by

NESTOR BARRETT, AIP, PLANNING CONSULTANT
San Jose, California

THE GENERAL PLAN

CITY OF HOLLISTER, CALIFORNIA

1976

[Hollister, City council]
City planning Hollister

Prepared by
NESTOR BARRETT, AIP, PLANNING CONSULTANT
San Jose, California

CITY COUNCIL
CITY OF HOLLISTER, CALIFORNIA

Alfred Ledford, Mayor
Henry Solorio, Vice Mayor
Gordon Machado Quenten Taylor
Patricia A. Pickering

Roger Grimsley, City Manager
Frank D. Felice, City Clerk

PLANNING COMMISSION

Larry Nicholson, Chairman
Jose Alvarez Jerry Brown
Arthur (Bob) Cruz Alfred Goularte

Thomas E. Barry, Secretary

Table of Contents

FOREWORD

The history of Hollister General Plans extends back to the year 1959 when the consulting firm of Pacific Planning and Research prepared the first City General Plan.

In 1965, as a result of a cooperative agreement between Hollister, San Juan Bautista and San Benito County, a comprehensive plan for both cities and the county was adopted. This plan was largely financed by a grant from the federal government.

In 1969 changing conditions in the Hollister area led the City Council to conclude that the 1965 Plan should be revised. This was done and the plan was officially adopted by the City Council on August 18th of that year.

In July, 1975 the City Council authorized the preparation of the 1976 General Plan for the City and work on it was begun in August, 1975.

GENERAL PLAN
CITY OF HOLLISTER
REGIONAL MAP

0 1 2 3 4
MILES

Background. The City of Hollister is the county seat of San Benito County. It is one of the oldest cities in California having been incorporated March 26, 1874. It is located in the north central section of the county and is the largest of the County's two incorporated cities having a population of 8,575.(1) The smaller city, San Juan Bautista, is the location of one of the historic California Missions.

San Benito County is a part of the Central Coast Region of California, its principal industry being agriculture. It, along with its adjoining counties, is a part of one of the world's largest agricultural complexes (see map facing page). Hollister serves as a center for the county's agricultural, business, industrial and cultural activities.

In addition to the area within its official incorporated boundaries, Hollister is the hub of a substantially undeveloped area surrounding it. This area has a population of approximately 12,000,(2) a substantial proportion of the 19,500 total county population.

---

(1) July 1, 1975 estimate by Department of Finance, State of California

(2) November, 1974 estimate by California Department of Transportation

Scope. In 1971 the California Legislature established in considerable detail the requirements for general plans. It also made it mandatory for cities and counties to either revise or adopt new general plans based on the new criteria.

During the most recent sessions of the Legislature additional regulations were added, mandating that general plans and zoning ordinances must correspond, and that no zoning regulation can be validly adopted by a city unless it conforms to the general plan.

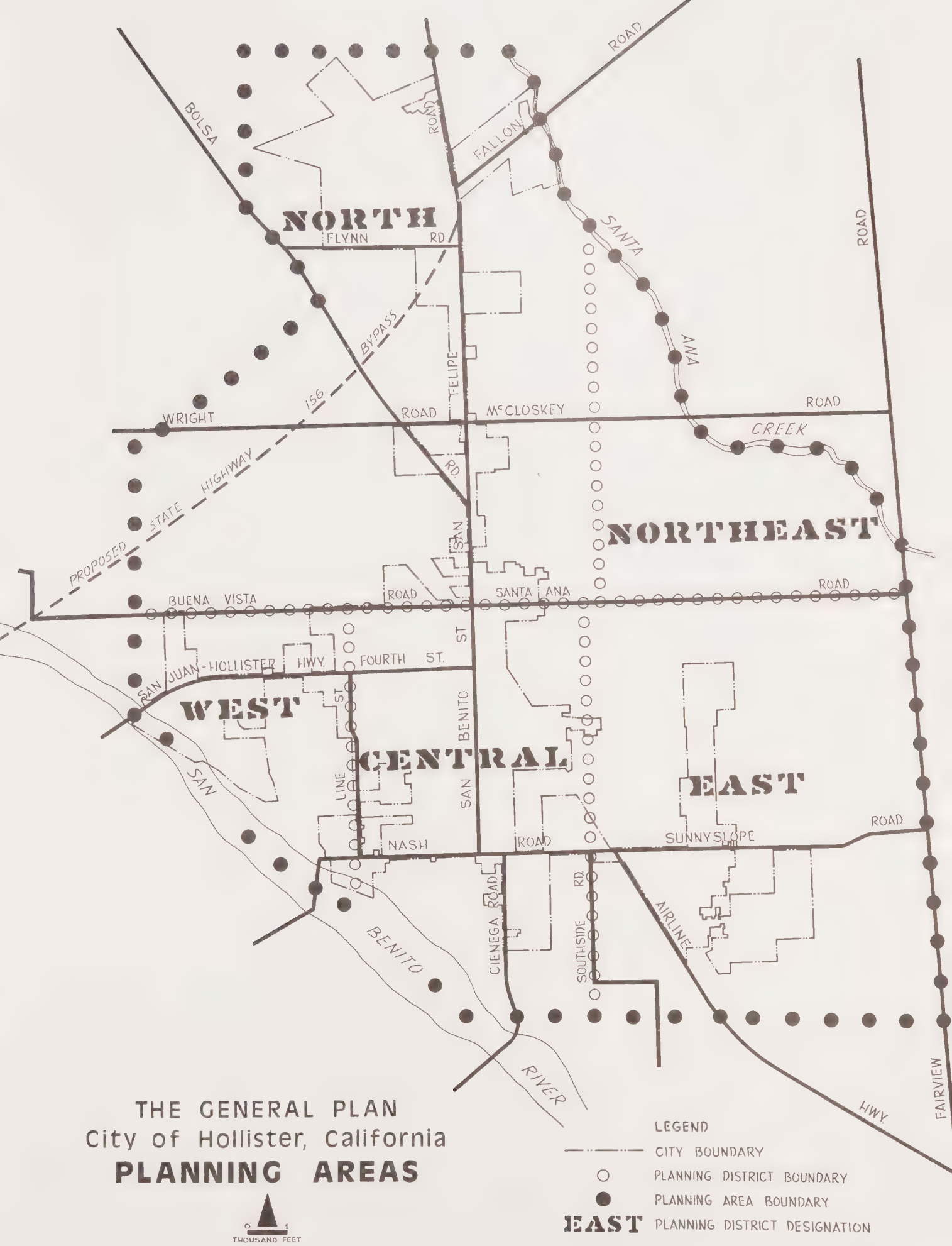
The legislation provides that a general plan must consist of certain separate elements, some of which are mandatory. Others are listed but need not be adopted unless the governing body decides they are required.

The mandatory elements are:

Land Use
Circulation
Housing
Conservation
Open Space
Safety
Seismic Safety
Noise
Scenic Highways

Because of the urgent need for the background information which will be developed in connection with their preparation, the Land Use and Circulation Elements are given first priority in this program.

The Open Space Element was previously adopted in 1972, and therefore is not included.


NORTH
NORTHEAST
WEST
CENTRAL
EAST
BOLSA ROAD
FALLON ROAD
FLYNN RD
SANTA ANA CREEK
ROAD
WRIGHT ROAD
McCLOSKEY ROAD
SAN FELIPE RD
156 BYPASS
PROPOSED STATE HIGHWAY
BUENA VISTA ROAD
SANTA ANA ROAD
SAN JUAN-HOLLISTER HWY.
FOURTH ST.
SAN BENITO ST
LINE ST
NASH ROAD
SUNNYSLOPE ROAD
CIENEGA ROAD
SOUTHSIDE RD
AIRLINE HWY.
FAIRVIEW
SAN BENITO RIVER
THE GENERAL PLAN
City of Hollister, California
PLANNING AREAS
0 1
THOUSAND FEET
LEGEND
CITY BOUNDARY
PLANNING DISTRICT BOUNDARY
PLANNING AREA BOUNDARY
EAST PLANNING DISTRICT DESIGNATION

The Plan and Planning Area. The introductory paragraph to Section 65302 of the Government Code of California reads in part as follows:

> "The General Plan shall consist of a statement of development policies and it shall include a diagram or diagrams and text setting forth objectives, principles, standards, and plan proposals."

The Government Code also provides that the plan must not be confined to the precise boundaries of the city at the time it is prepared, but should cover those areas beyond the city boundaries which are primarily affected by city functions. In this connection the Government Code states in Section 65301:

> "The General Plan shall be so prepared that all or individual elements may be adopted by the legislative body, and so that it may be adopted by the legislative body for all or part of the territory of the county or city and such other territory outside its boundaries which in its judgment bears relation to its planning."

When the 1969 General Plan was prepared the planning area defined for Hollister was somewhat larger than the one being currently used. This new area has been approved by the Planning Commission and City Council. The planning area and the area inside the present city limits are shown on the map on the facing page. The black dots define the planning area.

This area has been divided into five subareas, called planning districts, with the names north, northeast, west, central and east. These are defined by the white dots.

It is a general rule that General Plans should be updated every five years. By establishing these five districts it will be possible at the end of each year during that period to make an intensive review of one of the districts. Land use activity frequently is concentrated in a certain area and the ones requiring the most attention can be chosen for study first.

This method will assure that when the end of the five year period is reached that the plan will have been automatically brought up-to-date and the necessity for an extensive review will be obviated.

The planning districts will also make possible a more sophisticated planning analysis as they can be used in all future statistical compilations.

Goals, Policies and Objectives. On August 28, 1975 the Hollister Planning Commission adopted Resolution No. 75-13 establishing Goals, Policies and Objectives for the General Plan Revision. The resolution reads in part as follows:

> WHEREAS, detailed and specific planning which the General Plan will incorporate for the various land uses and area components of the City of Hollister is based upon the concept of need, function and environmental concern of the total community; and
>
> WHEREAS, the goals, objectives and policies are intended to provide overall direction required to set the framework for all subsequent policies related to regional roles of the community, the size, the basic ability, the needs of the people and the relation of the basic economical, social components of our community, and
>
> WHEREAS, the overall objectives, goals and policies outlines will help guide and promote coordinated efforts of social, economical and environmental concerns of the Hollister community;

1. Residential, commercial and industrial development should take place in a compact pattern, and new lands should not be open for development indiscriminately until old lands, already committed for such use, has been filled. Prime agricultural land should be preserved from urban growth whenever possible, because of the importance of its agricultural base to the economy of the City and the County. Annexations of new areas to the City should be in orderly, compact increments outward from the existing city limits. Urban growth should generally be restricted to the areas contiguous to present existence of urbanization. Establish stage growth zones beyond existing city limits and develop techniques to insure that growth occurs in each zone as programed.

2. Basic goal of our General Plan is to provide equal opportunity of all residents within the community a chance for quality living and suitable living standards. All citizens residing in the community will have the opportunity to enjoy a quality of living through comprehensive planning efforts for physical, mental, intellectual, cultural development with participation in public affairs, maximum employment, leisure and recreational ability, and for adequate housing and privacy.

3. Commercial areas should not greatly exceed the amount necessary to serve the demand for retail and service trades to be generated by the anticipated population. Noncontiguous, spot commercial zoning outside the main central business district should be discouraged. Organized, well planned and functional neighborhood shopping centers should prevail as incidental to the central business district.

4. The present central business district should be encouraged to continue as the center of major retail shopping for San Benito County.

5. Other commercial uses, professional or administrative offices should be provided for in special areas outside the central business district. These special areas should be utilized as functional needs for the community.

6. Industrial areas should be provided large enough to allow for anticipated industrial growth, if and when growth comes. These areas should be protected from encroachment by other uses and, in turn, should not intrude on other areas of the city. Industrial areas should be located to take advantage of rail, highway and air access. Proper zoning policies should be developed to insure buffer zoning between residential uses and industrial uses.

7. Present canneries, which now provide such an important increment of Hollister's economy, should be accommodated in their present location, without letting further industrial use expand, without control, into commercial or residential areas adjacent to the canneries.

8. School sites should be designated within residential districts which the schools serve.

9. Spaces should be provided for future park and recreational facilities.

10. A civic center should be provided near the present County Court House square and central business district, so that this area may continue as a focus for community and economical life in the City and County.

11. Through traffic now entering the City of Hollister on State highways should bypass the City.

12. A circulation system should be provided in an outer loop around the City and an inner loop around the downtown area, with connections to the Sunnyslope area and to the State bypass routes.

13. Area to be held for potential future development should be designated as reserves.

14. Areas subject to flooding and inundation should be designated as areas not suitable for building or growth and reserved specifically for park, recreational and flood control areas.

15. Basic goal of the General Plan revision is to provide adequate and conducive atmosphere for continual growth of existing businesses and industries.

On October 6, 1975 the City Council of Hollister adopted Resolution No. 75-48 making these goals, policies and objectives the official ones of the City of Hollister.

LAND USE ELEMENT

Table of Contents

TABLE 1

CITY OF HOLLISTER
LAND USE
(by Planning Districts)

Land Use	Central	West	North	East	Total Inside City Limits	Northeast	County Unincorporated	Total Planning Area
Single Family	249.88	22.86	21.51	95.04	389.29		33.97	423.26
Multiple Family	20.43	30.40	3.02	15.39	69.24		5.62	74.86
Commercial	62.39	2.86	26.20	6.25	97.70			97.70
Industrial	34.66	11.25	50.41	-	96.32		26.40	122.72
Agriculture/Vacant	88.34	61.48	339.70	132.86	622.38		5,846.57	6,468.95
Public/Quasi-Public	196.44	120.12	247.64	96.42	660.62		207.52	868.14
Total	652.14	248.97	688.48	345.96	1,935.55		6,120.08	8,055.63

Northeast - No part of Northeast District is within the Hollister City Limits

Public and Quasi-public lands include churches, schools, parks, institutions, streets, railroads, and city and county owned land.

Existing Land Use. Major categories of land use, which are summed up in Table 1, (facing page), are as follows:

(a) Single-family dwellings
(b) Multiple-family dwellings, including duplex or two-family dwellings, apartments, nursing homes, trailer parks, hotels and motels, and land where two or more single-family dwellings occupy a single lot.
(c) Commercial uses, including parking
(d) Industry, light and heavy
(e) Agricultural and vacant lands
(f) Public and quasi-public lands, including schools, parks, railroads, streets and institutions.

In the 1969 Revision of the Hollister General Plan the following comments were made about land use. They are as pertinent today as they were then.

> "It is the people themselves who develop the land uses, and conversely, the land uses are there for the sole benefit of people. Therefore, the amount of land use for each thousand persons is a much more significant figure than the percentage of one land use as related to another.
>
> "Let us assume that a table has been prepared which shows only the percentages of land uses. We might note, for example, in Table 2, column 2, (following page) that 3.57 per cent of land in Hollister is used for multiple dwellings. Suppose the city now annexes an industrial area containing 200 acres. Immediately all the percentages in the table will change, although the amount of actual use in multiple dwellings will not have changed at all. Only the amount of land in a particular use as related to the number of people in Hollister will be affected by any changes in the land area of the city.

TABLE 2

EXISTING LAND USE
CITY OF HOLLISTER

Type	Acres Inside City Limits	% of Total	Acres in Planning Area	% of Total	Acres per 1,000 people: Inside City Limits	Acres per 1,000 people: Planning Area
Single Family	389.29	20.11	423.26	5.26	45.40	35.27
Multiple Family	69.24	3.57	74.86	.93	8.07	6.24
Commercial	97.70	5.05	97.70	1.21	11.39	8.14
Industry	96.32	4.98	122.71	1.52	11.23	10.23
Agriculture and Vacant	622.38	32.16	6,468.95	80.30	72.58	539.08
Public and Quasi-Public Lands	660.62	34.13	868.14	10.78	77.04	72.34
Total	1,935.55	100.00	8,055.63	100.00	225.71	671.30

Hollister population 8,575
Planning Area Population 12,000

"Moreover, it is useful to keep data of this type up-to-date for the continuing use of the Planning Commission and City Council. All land developers, including those who build multiple dwellings, shopping centers or establish industrial parks, use private survey data based on population, housing and levels of income. They are not interested in the percentages of various types of land use in any city, since this data is of very little value to them. Thus, in judging presentations made to the Planning Commission and City Council by those who wish to change the land use pattern, it is much more valuable to have the land use expressed as shown in columns 5 and 6, than in the way it is shown in columns 2 and 4.

"We have computed it on the basis of percentages as well as on the other basis, because this was the common practice in the past and these computations can be used to compare this report with those which the city has had made in former years."

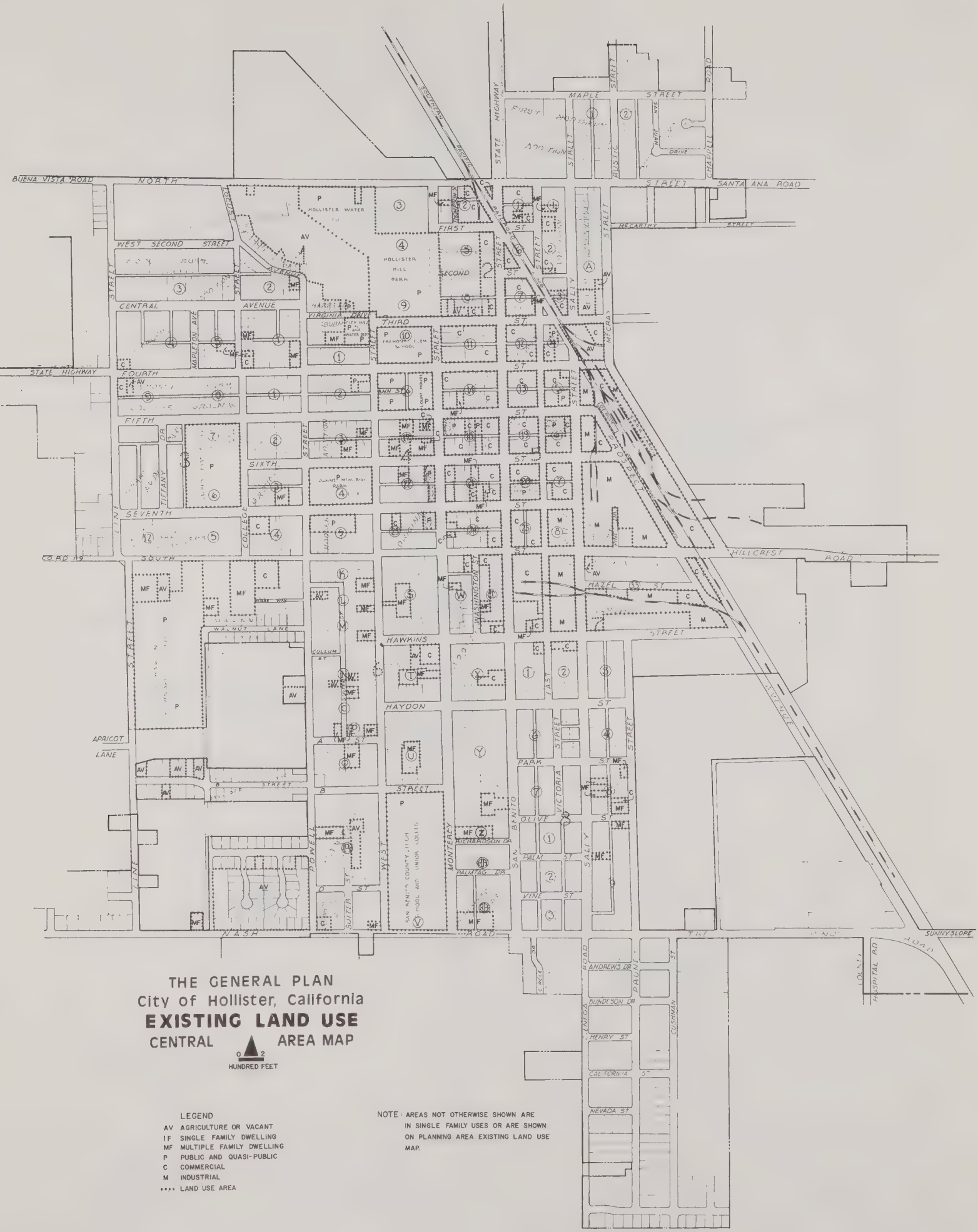
Column 1 in Table 2 shows the number of acres in each type of land use inside the city limits including the Hollister Airport and disposal grounds.

Column 2 indicates the percentage of each actual use of land within the city limits.

Columns 3 and 4 indicate the same information for the planning area, including the area within the city limits.

Columns 5 and 6 indicate the land use for each thousand persons in the city and planning area, assuming a city population of 8,575. The assumed population for the planning area is 12,000.

Maps showing Existing Land Use in the City and Planning Area are on the following pages.



THE GENERAL PLAN
City of Hollister, California
EXISTING LAND USE
CENTRAL AREA MAP

0 2
HUNDRED FEET

LEGEND

- AV AGRICULTURE OR VACANT
- 1 F SINGLE FAMILY DWELLING
- MF MULTIPLE FAMILY DWELLING
- P PUBLIC AND QUASI-PUBLIC
- C COMMERCIAL
- M INDUSTRIAL
- •••• LAND USE AREA

NOTE: AREAS NOT OTHERWISE SHOWN ARE IN SINGLE FAMILY USES OR ARE SHOWN ON PLANNING AREA EXISTING LAND USE MAP.

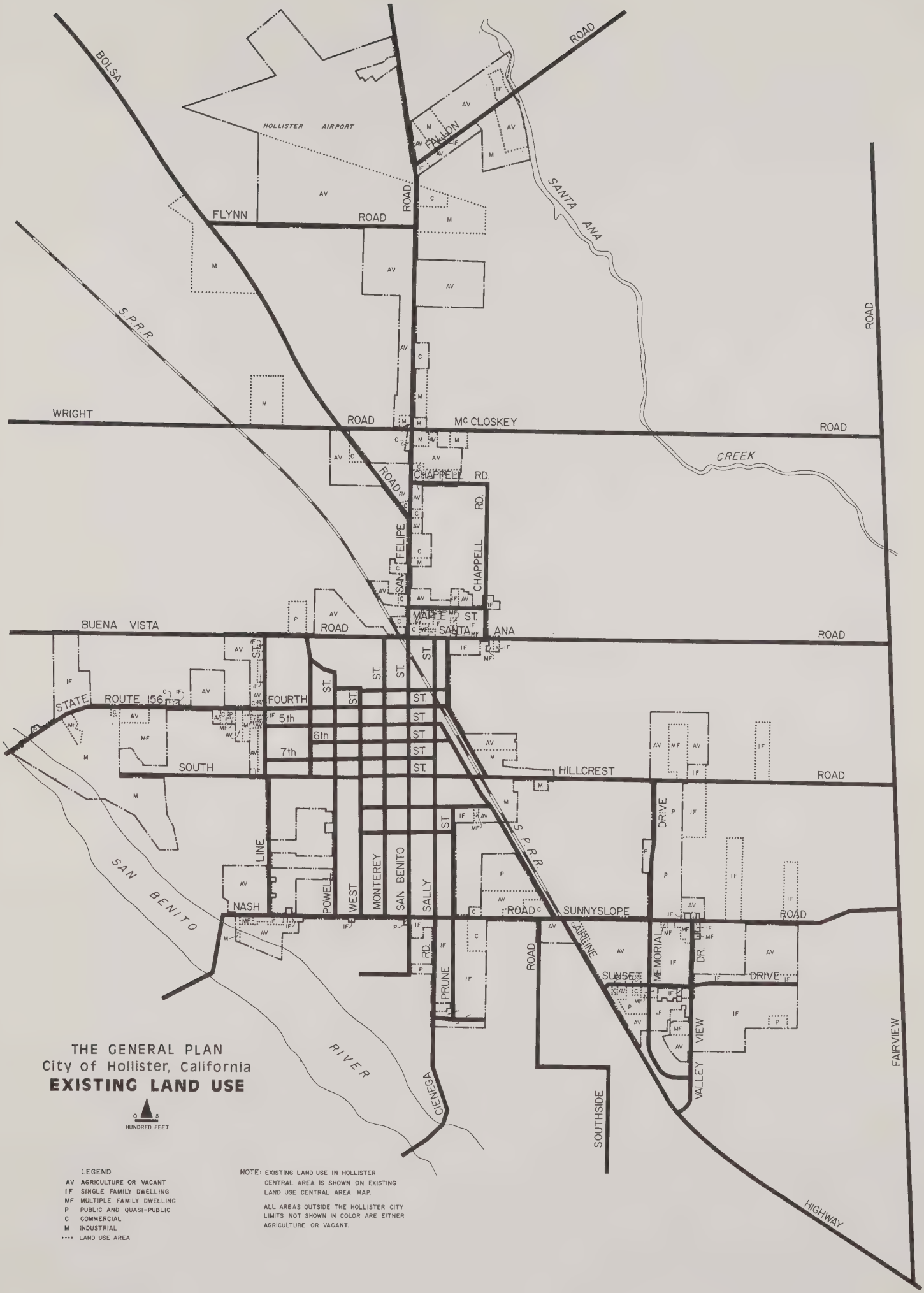

THE GENERAL PLAN
City of Hollister, California
EXISTING LAND USE
0 5
HUNDRED FEET
LEGEND
AV AGRICULTURE OR VACANT
IF SINGLE FAMILY DWELLING
MF MULTIPLE FAMILY DWELLING
P PUBLIC AND QUASI-PUBLIC
C COMMERCIAL
M INDUSTRIAL
LAND USE AREA
NOTE: EXISTING LAND USE IN HOLLISTER CENTRAL AREA IS SHOWN ON EXISTING LAND USE CENTRAL AREA MAP.
ALL AREAS OUTSIDE THE HOLLISTER CITY LIMITS NOT SHOWN IN COLOR ARE EITHER AGRICULTURE OR VACANT.
HOLLISTER AIRPORT
BOLSA ROAD
FALLON ROAD
FLYNN ROAD
SANTA ANA CREEK
S.P.R.R.
WRIGHT ROAD
Mc CLOSKEY ROAD
CHAPPELL RD.
SAN FELIPE ROAD
CHAPPELL RD.
MAPLE ST.
BUENA VISTA ROAD
SANTA ANA ROAD
STATE ROUTE 156
FOURTH ST.
5th ST.
6th ST.
7th ST.
SOUTH ST.
HILLCREST ROAD
SAN BENITO RIVER
NASH LINE
POWELL ST.
WEST ST.
MONTEREY ST.
SAN BENITO ST.
SALLY ST.
PRUNE RD.
CIENEGA ROAD
SUNNYSLOPE ROAD
CAREline ROAD
SOUTHSIDE ROAD
SUNSET DRIVE
MEMORIAL DR.
DRIVE
VALLEY VIEW DRIVE
FAIRVIEW ROAD
HIGHWAY

TABLE 4

CITY OF HOLLISTER
ZONING
(in Acres)

Zoning	Central	West	North	East	Total Inside City Limits	North-east[1]	County Unin-corporated	Total Planning Area
Single Family	261.20	46.23	50.58	211.47	569.48		1,153.91	1,723.39
Multiple Family	138.50	70.91	21.58	41.22	272.21			272.21
Commercial	78.63	8.32	25.86	27.95	140.76			140.76
Industrial	61.95	110.30	387.59	1.64	561.48		99.60	661.08
Other					391.62[2]			5,258.19[3]
Total Acres					1,935.55			8,055.63

(1) All of the Northeast area is in the County unincorporated territory.

(2) Includes streets, railroad, river

(3) Includes agriculture, streets, railroad, river

Existing Zoning. Just as it is useful to measure the actual land use in any planning area, it is equally useful to measure the existing zoning.

The measurements of existing zoning for the area inside the city limits are shown in Table 3.

TABLE 3

EXISTING ZONING
HOLLISTER, CALIFORNIA
(inside city limits)

Zoning	Area in Acres	% of Total	Acres per 1,000 people
Single-family	569.48	29.42	66.41
Multiple-family	272.21	14.06	31.74
Commercial	140.76	7.27	16.41
Industrial	561.48	29.00	65.48
Other	391.62	20.25	45.68
Total	1,935.55	100.00	225.72

It should be noted that no figures are indicated for agriculture and public/quasi-public zoning because these two zones are not included on the Hollister City Zoning Map. Most of the public and quasi-public uses are in R-1 zones where they are allowed under the use permit status. Agricultural areas are primarily zoned R-1.

What may appear to be an excess of industrial zoning is accounted for by the fact that the airport and the area adjacent to it is included in this classification.

Table 4, (facing page), shows the zoning in acres for the area inside the Hollister city limits as well as for the unincorporated county area which is included in the overall planning area.

TABLE 5

COMPARATIVE LAND USES AND ZONING
ACRES PER 1000 PERSONS
(Inside City Limits)

Type of Use	Hollister		Watsonville (1)		Santa Cruz		Hayward	
	Land Use	Zoning	Land Use	Zoning	Land Use	Zoning	Land Use	Zoning
Single Family	45.40	66.41	90.64	123.04	119.81	136.80	29.46	36.50
Multiple Family	8.07	31.74	5.85	33.74	29.55	38.13	9.12	18.77
Commercial	11.39	16.41	36.26	28.01	15.81	17.46	5.84	8.34
Industrial	11.23	65.48	25.15	41.58	10.94	14.40	20.33	26.07
Other	149.62	45.68	375.79	268.01	5.36	13.19	185.50	160.58

(1) Planning Area

Comparative Data. The figures on existing land use and on existing zoning taken by themselves have very little meaning. But when they are combined into one table and compared with similar information for the Cities of Watsonville, Santa Cruz and Hayward, the information becomes much more meaningful. These comparisons are shown in Table 5 (facing page).

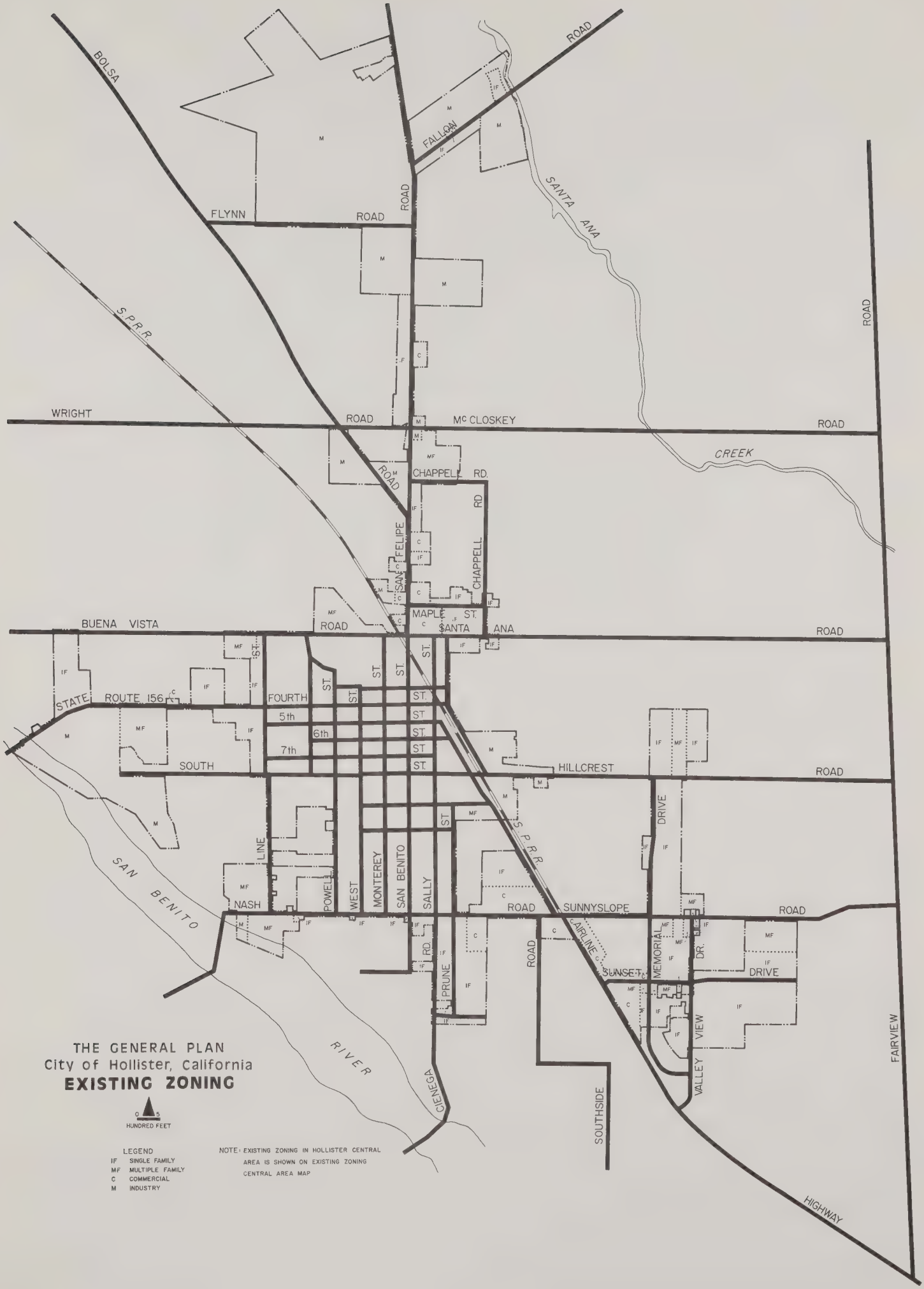
Perhaps the most interesting fact to be derived from Table 5 is the excess of zoning over land use shown for multiple dwellings. Although in the City of Hollister the zoning provides for 31.74 acres of multiple housing for each 1,000 people in the population, the actual use of land for multiple housing is only approximately 8 acres per 1,000 people. In short, there is almost four times as much land available for multiple housing as is presently in use for that purpose.

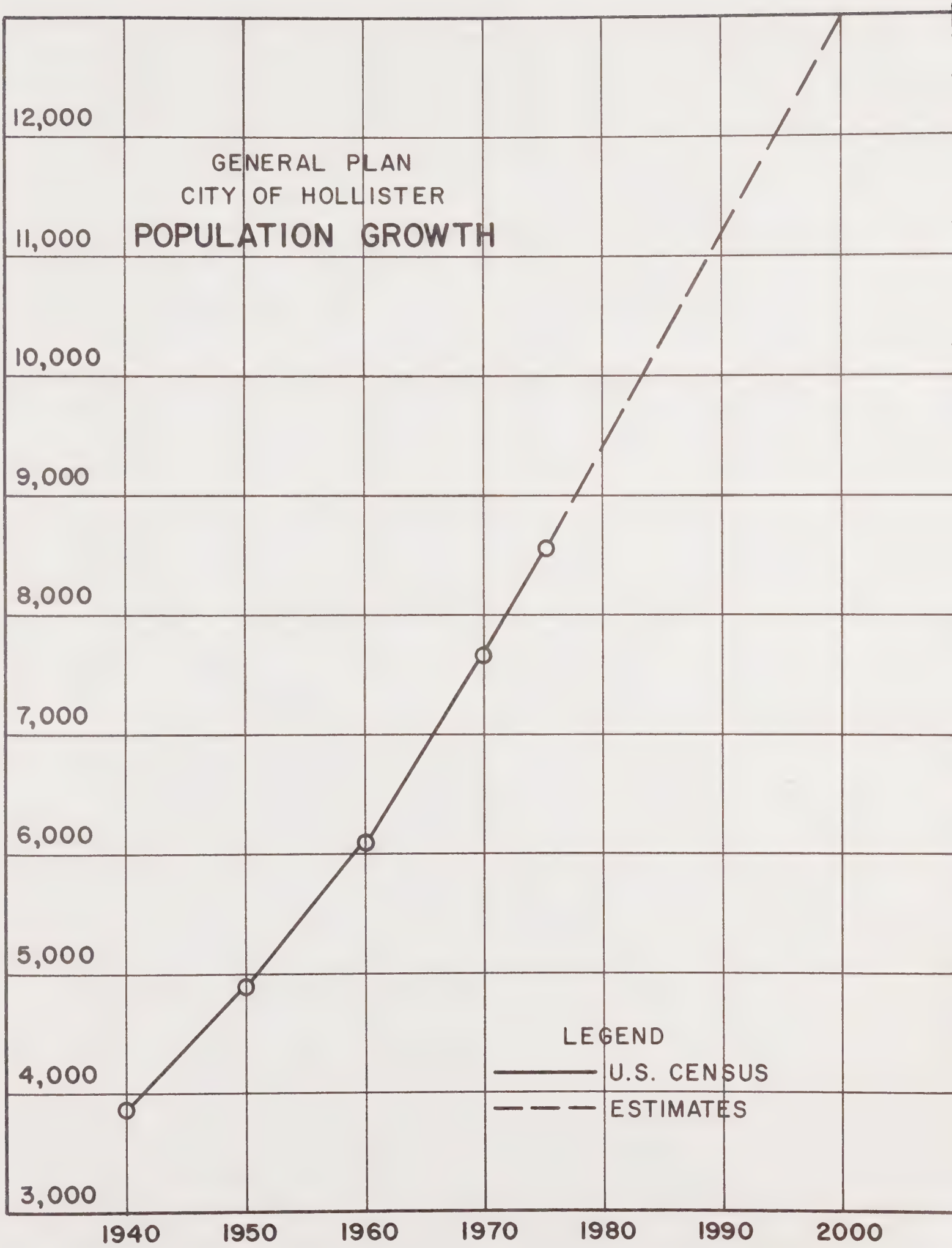
The same heavy imbalance between zoning and land use for multiple housing is found in the City of Watsonville. However, in the case of Santa Cruz where there is a very high ratio of land use in multiples, the zoning is by no means as far out of balance. This is also somewhat true of Hayward where multiple zoning only exceeds actual land use by two times.

Hollister commercial zoning and land use is not out of line with other cities as can be seen from the table. An interesting situation exists in Watsonville where there is more actual land use for commercial than is zoned for that purpose, indicating that there is a substantial percentage of nonconforming uses. In Santa Cruz there is very little land zoned commercial that is not already used that way, and the same is true of Hayward.

Again it should be pointed out that the great excess zoned for industrial use in Hollister as compared with that in actual use reflects the fact that the airport is all zoned for industry. Maps showing existing zoning for the City and Planning Area are on the following pages.


THE GENERAL PLAN
City of Hollister, California
EXISTING ZONING
CENTRAL AREA MAP
0 2
HUNDRED FEET
LEGEND
IF SINGLE FAMILY
MF MULTIPLE FAMILY
C COMMERCIAL
M INDUSTRY
ZONE BOUNDARY
BUENA VISTA ROAD
NORTH
STATE HIGHWAY
WEST SECOND STREET
CENTRAL AVENUE
FOURTH
FIFTH
SIXTH
SEVENTH
SOUTH
HILLCREST ROAD
HAZEL ST
HAWKINS
HAYDON
PARK
OLIVE
PALM ST
VINE ST
WASH ROAD
TRES PINOS
SUNNYSLOPE ROAD
MAPLE STREET
SANTA ANA ROAD
HOLLISTER WATER CO
HOLLISTER HILL PARK
VIRGINIA DRIVE
THIRD
FREMONT ELEM SCHOOL
DUNNE MEMORIAL PARK
SACRED HEART SCHOOL
R O HARDIN ELEMENTARY SCHOOL
SAN BENITO COUNTY HIGH SCHOOL AND JUNIOR COLLEGE
WALNUT LANE
APRICOT LANE
SUNNYSIDE
MONTEREY
SAN BENITO
VICTORIA
SALLY
POWELL
WEST
MCCRAY
CUSHMAN
CIENEGA
ANDREWS DR
BUNDESON DR
HENRY ST
CALIFORNIA ST
NEVADA ST
COUNTY HOSPITAL RD


THE GENERAL PLAN
City of Hollister, California
EXISTING ZONING
0 5
HUNDRED FEET
LEGEND
IF SINGLE FAMILY
MF MULTIPLE FAMILY
C COMMERCIAL
M INDUSTRY
NOTE: EXISTING ZONING IN HOLLISTER CENTRAL AREA IS SHOWN ON EXISTING ZONING CENTRAL AREA MAP
BOLSA ROAD
FALLON ROAD
SANTA ANA CREEK
FLYNN ROAD
S.P.R.R.
WRIGHT ROAD
Mc CLOSKEY ROAD
CHAPPELL RD.
SAN FELIPE ROAD
CHAPPELL RD
MAPLE ST.
BUENA VISTA ROAD
SANTA ANA ROAD
STATE ROUTE 156
FOURTH ST.
5th ST.
6th ST.
7th ST.
SOUTH ST.
HILLCREST ROAD
SAN BENITO LINE
NASH ROAD
POWELL ST.
WEST ST.
MONTEREY ST.
SAN BENITO ST.
SALLY ST.
PRUNE RD.
SUNNYSLOPE ROAD
AIRLINE HIGHWAY
SUNSET DRIVE
MEMORIAL DR.
VALLEY VIEW DRIVE
FAIRVIEW ROAD
SOUTHSIDE ROAD
CIENEGA
SAN BENITO RIVER


GENERAL PLAN
CITY OF HOLLISTER
POPULATION GROWTH
12,000
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
1940
1950
1960
1970
1980
1990
2000
LEGEND
U.S. CENSUS
ESTIMATES

Population. Table 6, which follows, shows the historic population growth of the City of Hollister from 1940 through 1975 and indicates the projection through the year 2000. A graph showing this growth and its projection is on the facing page. The projection is obtained by extending in a straight line the slope of the curve between 1970 and 1975. An extension based on connecting 1960 and 1975 points would give only a slightly different result and is therefore not shown.

TABLE 6

POPULATION GROWTH
HOLLISTER, CALIFORNIA
Within City Limits

Year	Population	Increase	Percentage of Growth
1940	3,881		
		1,022	26.2
1950	4,903		
		1,168	23.8
1960	6,071		
		1,592	26.2
1970	7,663		
		912	11.9
1975	8,575		
		825	9.6
1980	9,400		
		1,850	19.7
1990	11,250		
		1,750	15.5
2000	13,000		

Sources: Population for years 1940 through 1970 - U. S. Bureau of the Census
Population for 1975 - Department of Finance, State of California
All others are estimates by Consultant

By examining the table it can be seen that the 1940-50 and 1960-70 decades were the periods of the highest growth rate which the city has had. During the 1950-60 decade the rate fell off slightly and, curiously, this decade rate is identically the same as the rate for the first five years of the 1970-80 ten-year span.

All of the foregoing statements obviously are based on the percentages in order to arrive at comparable figures. Even though the rate of growth, however, seems to be declining slightly the actual numerical growth is, of course, gaining because higher and higher numbers are being dealt with as time goes by. Thus we can expect to see a population approaching 10,000 by 1980 and reaching the 13,000 mark by the year 2000.

We have shown no table or chart for the planning area. This is because figures for this were never compiled before 1965 and the time span is too short to have any meaningful projections.

However, it appears clear, as was pointed out in the 1965 General Plan, that there never will be any problem in this century of accommodating those who wish to live in the Hollister Planning Area.

If it is assumed that half of the land in the area will be devoted to dwellings of various types, that the average size of a family will remain between three and four, and that the overall residential density will not be greater than six families to the acre, the holding capacity of the area will be in excess of 75,000 people.

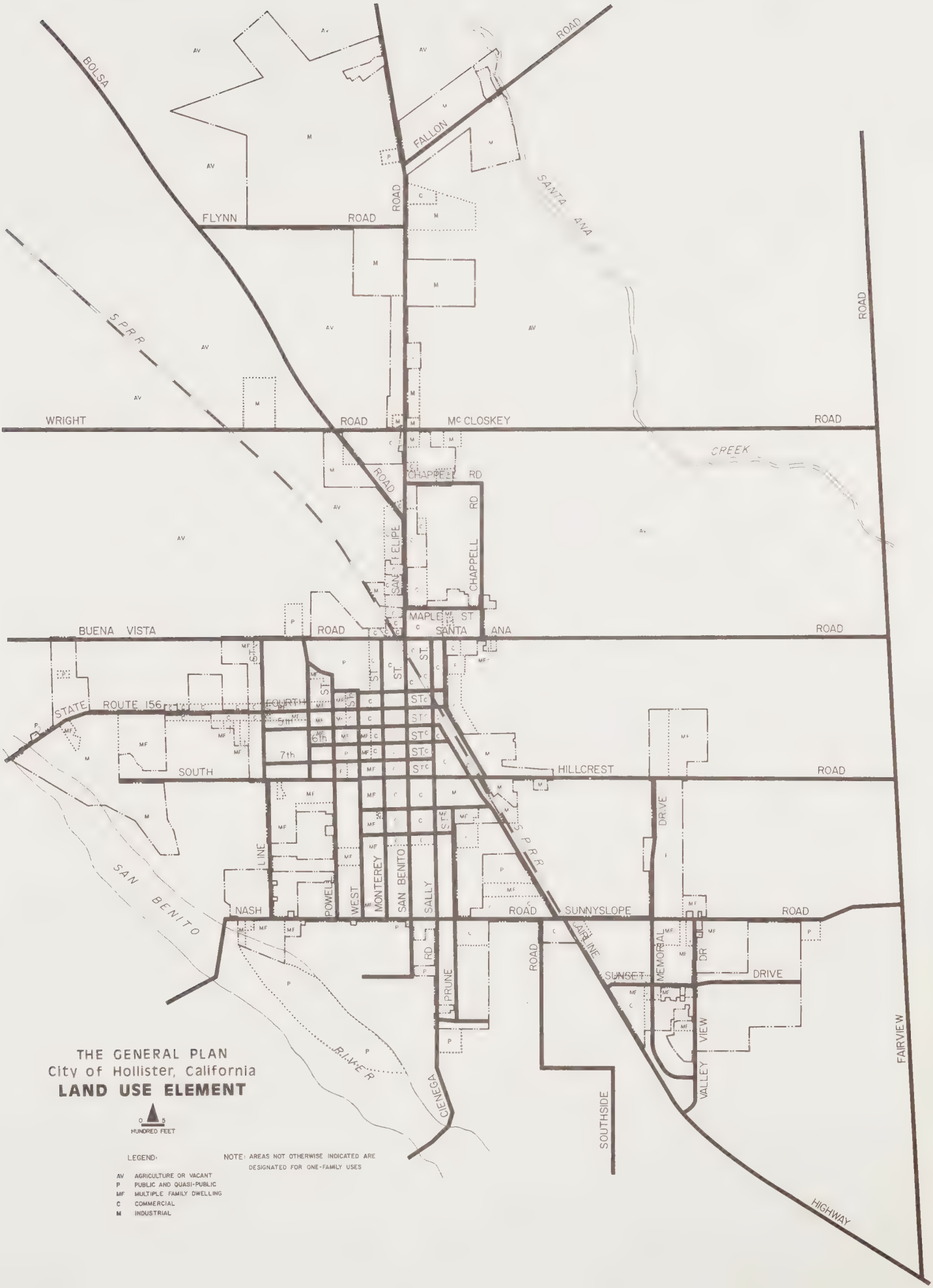
In reviewing these figures it should be borne in mind that all population predictions are based upon the premise that there will be no major war, widespread catastrophe or severe economic depression.

Neither do population predictions take into account unpredictable and extraordinary economic changes which would so alter the figures arrived at as to make them valueless. Such factors are unforeseen technological developments which would make some natural resource, such as a mineral found in the surrounding area, suddenly of great value; or the location in close proximity to the area of an employment center requiring a large labor force.

This section on population deals only with numerical growth. Education, ethnic origin and the like will be detailed in the section of this General Plan on Housing.

1976

LAND USE ELEMENT


BOLSA
ROAD
FALLON
ROAD
FLYNN
ROAD
SANTA ANA
S.P.R.R.
ROAD
WRIGHT
ROAD
Mc CLOSKEY
ROAD
CREEK
CHAPPEL
RD
ROAD
SAN FELIPE
CHAPPELL
RD
MAPLE ST
BUENA VISTA
ROAD
SANTA ANA
ROAD
STATE ROUTE 156
FOURTH
5th
6th
7th
SOUTH
HILLCREST
ROAD
S.P.R.R.
DRIVE
SAN BENITO
LINE
NASH
POWELL
WEST
MONTEREY
SAN BENITO
SALLY
ROAD
SUNNYSLOPE
ROAD
CAIRLINE
ROAD
MEMORIAL
DR
SUNSET
DRIVE
PRUNE
RD
VIEW
VALLEY
FAIRVIEW
RIVER
CIENEGA
SOUTHSIDE
HIGHWAY
THE GENERAL PLAN
City of Hollister, California
LAND USE ELEMENT
0 5
HUNDRED FEET
LEGEND:
AV AGRICULTURE OR VACANT
P PUBLIC AND QUASI-PUBLIC
MF MULTIPLE FAMILY DWELLING
C COMMERCIAL
M INDUSTRIAL
NOTE: AREAS NOT OTHERWISE INDICATED ARE DESIGNATED FOR ONE-FAMILY USES

Planning Area. When this project began in 1975 the Planning Commission and City Council directed that the Planning Area which had been established in the 1973 San Benito County General Plan be used for the 1976 Plan. Therefore all measurements of existing land use and zoning were made for that area. It was found to include 8,733.65 acres.

Several months later, after further consideration the two bodies decided that a large area north and west of the city was not likely to become a part of the city in the foreseeable future. It also includes prime agricultural land and should not be devoted to urban uses.

This change reduced the planning area by 678.02 acres so that it now contains 8,055.63 acres. The land use in all of the area is either agriculture or vacant.

The area inside the Hollister city limits has changed considerably since the 1965 General Plan was made. In 1965 it was 736 acres. When the 1969 revision was made the area had increased to 1,119 acres. The 1973 San Benito County General Plan showed 1,411 acres and in 1976 the City contains 1,936 acres.

A map of the proposed 1976 Land Use Element is on the facing page. Broad categories of land uses are indicated by letter symbols, except for single-family dwellings on those areas in which there is no symbol. It should be noted that all proposed single-family uses lie south of Buena Vista Road and Santa Ana Road in areas in which the city can reasonably be expected to serve such uses with the necessary utilities.

TABLE 7

CITY OF HOLLISTER
LAND USE

Use	Inside City Limits		Outside City Limits		Total Planning Area	
	Existing	Proposed	Existing	Proposed	Existing	Proposed
Single Family	389.29	689.01	33.97	2,866.70	423.26	3,555.71
Multiple Family	69.24	207.52	5.62	--	74.86	207.52
Commercial	97.70	140.33	--	29.68	97.70	170.01
Industrial	96.32	492.62	26.40	48.99	122.72	541.61
Agriculture/Vacant	622.38	--	5,846.57	3,091.28	6,468.95	3,091.28
Public/Quasi Public	660.62	406.17	207.52	83.33	868.14	489.50

Comparative Land Use. Table 7 which is on the facing page compares the actual existing land use with the total amount proposed in the General Plan.

The uses have been broken down for inside the city limits, outside the city limits, and for the total planning area. The greatest increase, numerically and percentage-wise, is in the area of industrial uses. This is accounted for by the fact that the Hollister Airport has been put in that classification.

Although the multiple family uses proposed appear to be a considerable increase it actually constitutes a reduction in the amount of land presently zoned for this use which is 272 acres. Moreover, much of this property is in the central area of the city where substantial amounts are actually occupied by single-family houses. What appears to be a substantial reduction in the amount of public and quasi-public property is accounted for by the changing of the classification of the Hollister Airport to an industrial use.

Statistical Analysis. Table 8 on the following page gives a comparison by percentages of the land uses for inside the city limits and for the planning area. There is also a portion of the table showing the number of acres per 1,000 people.

Table 9, following Table 8, gives a breakdown of the proposed land uses by planning districts inside the city limits. Figures are also given for the unincorporated area in the county and for the total planning area.

As an additional convenience for those who want to compare the various types of uses by planning districts both inside and outside the city limits Table 10 has been prepared. This table breaks down the proposed land uses by districts and in the unincorporated area of the county.

TABLE 8

PROPOSED LAND USE
CITY OF HOLLISTER

	Acres Inside City Limits	% of Total	Acres in Planning Area	% of Total	Acres per 1,000 people: Inside City Limits	Acres per 1,000 people: Planning Area
Single Family	689.01	36.60	3,555.71	44.14	80.35	296.30
Multiple Family	207.52	10.72	207.52	2.57	23.99	17.29
Commercial	140.33	7.25	170.01	2.11	16.37	14.17
Industrial	492.62	25.45	541.61	6.72	57.45	45.13
Agriculture/Vacant	--	--	3,091.28	38.37	--	257.61
Public-Quasi Public	406.17	20.98	489.50	6.07	47.37	40.79

Hollister Population 8,575
Planning Area Population 12,000

TABLE 9

CITY OF HOLLISTER
PROPOSED LAND USE
BY PLANNING DISTRICTS

Use	Central	West	North	East	Total Inside City Limits	County Unincorporated (Includes Northeast)	Total Planning Area
Single Family	193.74	91.70	219.15	184.42	689.01	2,866.70	3,555.71
Multiple Family	130.16	32.08	3.27	42.01	207.52		207.52
Commercial	74.67	14.92	27.63	23.11	140.33	29.68	170.01
Industrial	57.13	1.72	433.77	--	492.62	48.99	541.61
Agriculture/Vacant	--	--	--	--	--	3,091.28	3,091.28
Public-Quasi Public	196.44	108.55	4.76 (1)	96.42	406.17	83.33	489.50
Total	652.14	248.97	688.58	345.96	1,935.65	6,119.98	8,055.63

Northeast - No part of Northeast District is within the Hollister City Limits.
Public and Quasi-public lands include churches, schools, parks, institutions, streets, railroads, and city and county owned land.

(1) Hollister Airport included in the industrial classification.

TABLE 10

CITY OF HOLLISTER
PROPOSED LAND USE
DISTRICTS INSIDE AND OUTSIDE CITY LIMITS

Districts	Single-Family In	Single-Family Out	Multiple-Family In	Multiple-Family Out	Commercial In	Commercial Out
Central	193.74	438.94	130.16	--	74.67	--
West	91.70	335.11	32.08	--	14.92	11.02
North	219.15	--	3.27	--	27.63	18.66
East	184.42	1,570.36	42.01	--	23.11	--
Unincorporated (includes Northeast)		2,866.70		--		29.68

	Industrial In	Industrial Out	Agriculture/Vacant In	Agriculture/Vacant Out	Public/Quasi-public In	Public/Quasi-public Out
Central	57.13	2.70	--	--	196.44	77.71
West	1.72	--	--	--	108.55	--
North	433.77	46.29	--	2,330.06	4.76	5.62
East	--	--	--	--	96.42	--
Unincorporated (includes Northeast)		48.99		3,091.28		83.22

Zoning and Land Use. One further useful comparison is shown on Table 11, which follows.

TABLE 11

CITY OF HOLLISTER
EXISTING ZONING AND 1976 LAND USE
PLANNING AREA

	Acres per 1,000 people	
	Existing Zoning	1976 Land Use Plan
Single Family	66.41	296.30
Multiple Family	31.74	17.29
Commercial	16.41	14.17
Industrial	65.48	45.13
All Others	45.68	298.40 (1)

(1) Includes Public and Quasi-public, Agriculture and Vacant areas.

It allows a comparison of existing zoning in the planning area and the proposed land use. It should be borne in mind that the Land Use Plan and the Zoning Plan must correspond so that after this General Plan is adopted a new Zoning Map and new Zoning Ordinance will have to follow. This table shows the effect of the proposed Land Use Plan on existing zoning.

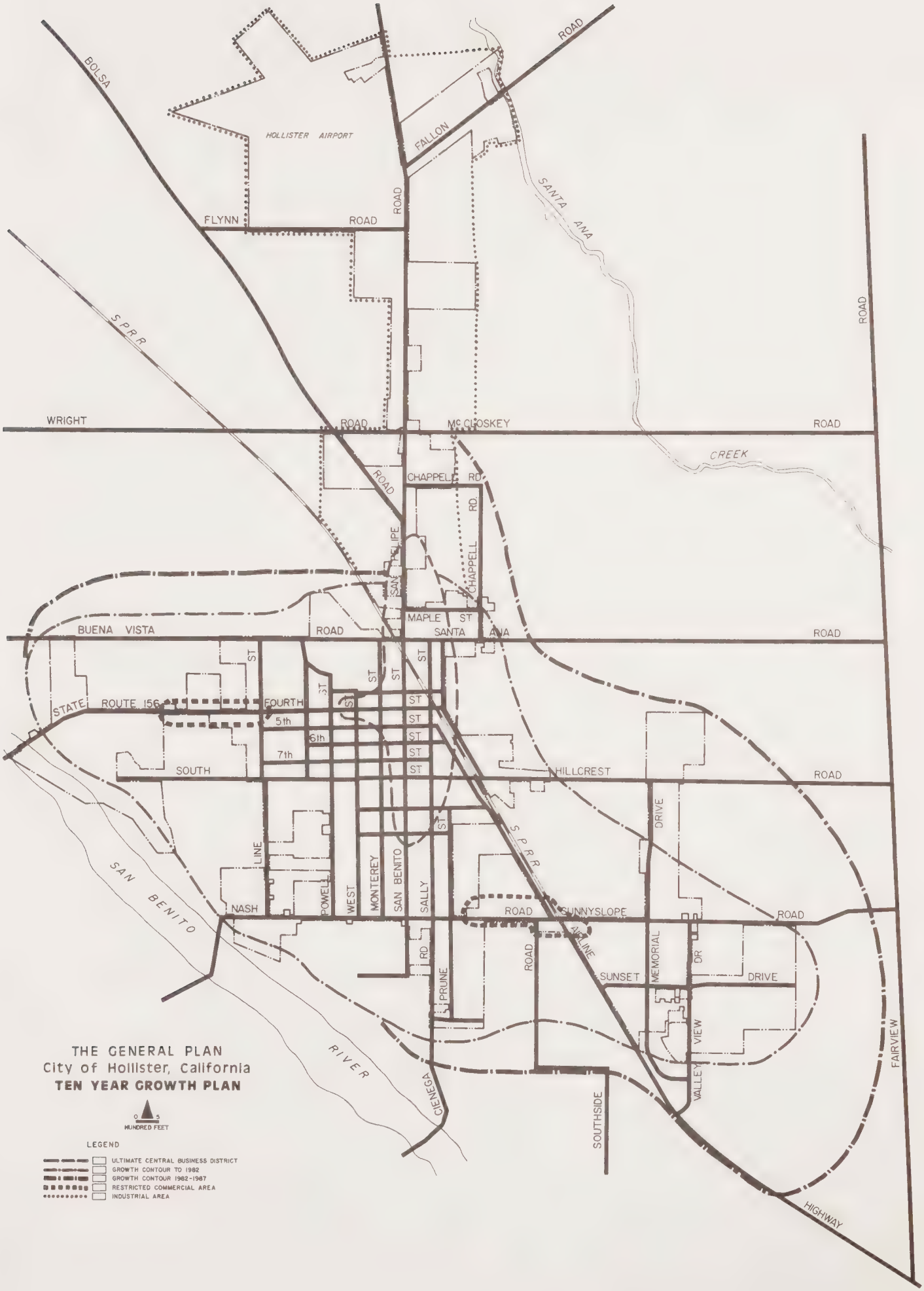
It should be noted from this table that the single-family dwelling use in this plan is about five times more than is currently under existing zoning in the city. This is because large agricultural areas which lie between the city and the eastern boundary of the planning area at Fairview Road are designated as future single-family areas.

Equally important is the comparison of multiple-family uses as presently zoned and that which is proposed. The zoning now provides 31.74 acres per thousand people for multiple housing, whereas when the new plan goes into effect this will be reduced by nearly a half to 17.29 acres.

Density. In connection with multiple-family uses, no density ranges are shown. During the hearings on this element these matters should be discussed and perhaps there should be at least two possible density ranges. There could be three, but in a city the size of Hollister, with its type of economic base coupled with the large amount of relatively inexpensive land available, there would seem to be little reason for crowding people into high density dwellings.

Density ranges also have to be expressed as gross or net. Net densities exclude all property except that actually used for the building itself and the yards around it. Thus, an area which is intended for subdivision with 6,000 square foot lots would have a net density of eight. If the lot size is raised to an 8,000 square foot minimum, then the net density drops to five.

If it is decided to use gross densities then the 6,000 square foot pattern will have a density of six and the 8,000 square foot pattern a gross density of 3½ to 4.


THE GENERAL PLAN
City of Hollister, California
TEN YEAR GROWTH PLAN
0 5
HUNDRED FEET
LEGEND
ULTIMATE CENTRAL BUSINESS DISTRICT
GROWTH CONTOUR TO 1982
GROWTH CONTOUR 1982-1987
RESTRICTED COMMERCIAL AREA
INDUSTRIAL AREA
HOLLISTER AIRPORT
BOLSA ROAD
FALLON ROAD
FLYNN ROAD
SANTA ANA CREEK
S.P.R.R.
WRIGHT ROAD
McCLOSKEY ROAD
CHAPPELL RD
SAN FELIPE ROAD
CHAPPELL RD
MAPLE ST
BUENA VISTA ROAD
SANTA ANA ROAD
STATE ROUTE 156
FOURTH ST
5th ST
6th ST
7th ST
SOUTH ST
HILLCREST ROAD
DRIVE
LINE
NASH
POWELL
WEST
MONTEREY
SAN BENITO
SALLY
SUNNYSLOPE ROAD
AIRLINE ROAD
SUNSET DRIVE
MEMORIAL DR
VALLEY VIEW
PRUNE RD
CIENEGA
SOUTHSIDE
FAIRVIEW
HIGHWAY
SAN BENITO RIVER

Ten-Year Growth Plan. It is the policy of the City of Hollister to require all land parcels which are annexed to have urban services available. These services are subject to, among other things, certain physical and financial constraints. For example, sewage disposal capacity for any given piece of property is dependent upon the size of the pipe line which serves it and upon the capacity of the sewage disposal plant to handle the additional load which is created when a vacant parcel is improved. Financing these facilities is a limiting factor.

A study of this problem has been made by the City's staff and those areas have been identified which can be furnished with adequate urban services through the next ten years, i.e. 1977-1987. When the land parcels that can be served are plotted upon a map it is found that their exterior boundaries can be outlined, and these outlines form a series of contours which can then be plotted upon a map of the city and its planning area. (See map facing page).

The map shows the growth contour from 1977 to 1982, and another contour for the period of 1982 to 1987. It also indicates the ultimate central business district, an additional restricted commercial area in the Sunnyslope part of the city, and the City's ultimate industrial area.

Therefore annexations to the city within the next five years must be confined to the inner contour, with the possible exception that if this area whould grow more rapidly than anticipated, growth within the outer contour can be accepted when 75% of the land within the inner contour has been developed. In short, the plan is based upon the assumption of a uniform annual growth rate of 3% over the next decade.

Plan Implementation. The General Plan is not self-executing. In fact it is not that kind of a document at all. It is essentially a statement of policy setting forth the kind and pattern of growth into which the city and its surrounding area should be molded. Furthermore it is only one unit in a much larger pattern including all of the other elements of the General Plan, as well as complex decisions which are influenced by federal and state programs and in an important measure by developments in the private sector.

As has been indicated the present Zoning Ordinance of the City will require considerable adapting and enlarging in order to carry out the policies set forth in this General Plan.

An entirely new zoning map and complete rewriting of the Zoning Ordinance will be required. It is also possible that substantial changes will have to be made in the Subdivision Ordinance, particularly concerning matters of seismic safety. There are the new proposals for scenic boulevards and for substantial ultimate changes in the State Highway pattern.

It is becoming more and more essential that the approach to area planning be on a broad basis which will require close cooperation between the City of Hollister and San Benito County. Higher levels of government are bringing pressure to bear, not only to bring about this kind of approach but a regional approach as well.

These are not small tasks. They will be time consuming and sometimes controversial, but approached in the right spirit the decisions arrived at should inure to the lasting benefit of the Hollister area.

APPROVAL

I hereby certify that the attached General Plan Element for the City of Hollister, California was duly and regularly approved by Resolution No. 76-10 of the Planning Commission of the City of Hollister on the 22nd day of July, 1976.

s/ Larry Nicholson
Chairman of the Planning Commission
of the City of Hollister

ATTEST:

s/ Thomas E. Barry
Secretary of the Planning Commission
of the City of Hollister

ADOPTION

I hereby certify that the attached General Plan Element for the City of Hollister, California was duly and regularly adopted by Resolution No. 76-64 of the City Council of the City of Hollister on the 26th day of October, 1976.

s/ Alfred Ledford
Mayor of the City of Hollister

ATTEST:

s/ Frank D. Felice
Clerk of the City of Hollister

CIRCULATION ELEMENT

TABLE OF CONTENTS

Foreword. In March 1975 the California Department of Transportation, in cooperation with the San Benito County Council of Governments, prepared a comprehensive Transportation Plan for the entire county. In the foreword to this plan the following statement is made:

> "The Regional Transportation Plan is a systems plan dealing with issues of county-wide and state-wide significance. The plan will address transportation needs for the next 20-year period (1975-1995). All feasible transportation modes will be considered including airports, highways, railroads, transit (buses), nonmotorized modes and pipelines."

This state plan and the environmental impact reports which accompany it are comprehensive and voluminous and contain vast amounts of useful and detailed material. It can, in fact, be said to be a precise, rather than a general plan. This Circulation Element is based upon much of the material gathered in the state study and also upon data developed by the Hollister and San Benito County Departments of Public Works. Five major topics were considered in the preparation of this Circulation Element. They are highway, airport, rail, public transit, and nonmotorized transportation.

Streets and highways are the predominant factor in Hollister planning area transportation. There is no air, rail or water passenger service. For persons coming into or leaving the county bus service is provided by Greyhound Lines. Internally there is a public bus service which connects Tres Pinos, Hollister and San Juan Bautista. School buses transport children to local schools and private buses move agricultural workers. No taxi service is available.

THE GENERAL PLAN
City of Hollister, California
EXISTING CIRCULATION ELEMENT

Highways. The existing Circulation Element of the Hollister General Plan was adopted by the City Council in 1969 and it is shown on the map on the facing page. This map shows only state highways and major city streets. It also shows the Hollister Airport, the Southern Pacific Railroad and a typical cross section for an 84-foot major street.

State Highways. The state highway system is administered by the California Department of Transportation. State highways in the Hollister planning area are under the direct jurisdiction of the Office of District 5 of that department which has its headquarters in San Luis Obispo.

Route 156. Route 156 connects with the Pacheco Pass Highway (Route 152) in Santa Clara County. It enters the city from the north and is known locally as San Benito Street. At its intersection with Fourth Street, Route 156 makes a right angle turn to the west where it connects Hollister and San Juan Bautista. This route is intersected by Route 180, which is called Bolsa Road. Route 180 connects Hollister with U. S. 101 at a point about two miles south of Gilroy. Between the intersection of Route 156 and 180 and the point where Route 156 turns west to San Juan Bautista the route is designated by two numbers, 156 and 180.

Route 180. Beyond Fourth Street Route 180 continues along San Benito Street until it intersects with Sunnyslope Road. Here it makes a right angle turn to the east to a point near the end of the Southern Pacific Railroad where it turns in a southeasterly direction and continues on into the county planning area beyond Fairview Road. From Sunnyslope Road to Fairview Road the highway is known locally as Airline Highway.

Major City Streets. Major city streets in Hollister, with one exception, are planned for an ultimate width of 84 feet. This, of course, excludes state highways.

Beginning with the most northerly east and west combination and proceeding southerly the first major street is Flynn Road. Next is the Wright Road-McCloskey Road combination. Next southerly is Buena Vista Road and Santa Ana Road. State Highway 156 is next and then South Street-Hillcrest Road. Nash Road and Sunnyslope Road complete the east-west system of major streets.

The planning area is somewhat deficient in north-south major streets and this situation will be corrected when this 1976 Circulation Element of the General Plan is adopted. Beginning at the westerly end of the planning area the first major street is Line Street. Next is the San Benito Street-San Felipe Road combination, then Prospect Road, Memorial Drive and Fairview Road.

The only exception to the standard 84-foot width for major streets is the Hillcrest Road-South Street combination. Here the standard is 80 feet.

State Highway Traffic Volumes. The latest traffic count data available for the state highway system are those compiled for the year 1974. They are shown for the two state highways in the planning area in Table 1 on the following page.

The figures shown above each breakpoint apply to the highway immediately back of the breakpoint and the figures shown below apply immediately ahead of the breakpoint. Therefore, between any two successive breakpoints along the route it may be assumed that traffic volumes will vary from one breakpoint to the next at a reasonably uniform rate of increase or decrease. Where only one set of figures appears between two breakpoints, a constant volume of traffic may be assumed for the intervening section of highway. All traffic volume figures include traffic in both directions.

Table 1

State Highway Traffic Volumes

Location	Peak Hour	Average Daily Traffic Peak Mo.	Annual
Route 156			
	1,100	8,700	7,700
Hollister W. City Limits			
	1,000	11,500	10,100
Powell Street			
	1,600	12,900	11,400
	1,350	12,900	11,400
Jct. Route 180, S.			
	1,700	15,900	14,000
	1,650	14,200	12,500
Jct. Route 180 N.			
	1,450	12,000	10,500
Santa Ana Creek Bridge			
	540	4,450	3,900
Fairview Road			
	510	4,200	3,650
Route 180			
Hollister So. Jct. of Route 156			
	1,400	14,700	12,900
	750	7,100	6,203
Nash Road			
	850	8,000	7,100
Southside Road			
	540	3,050	2,700
Valley View Road			
	240	1,350	1,200

Major Streets Traffic Volumes. Traffic volumes on major streets in the Hollister planning area are shown in the following table.

Table 2

Major Street Traffic Volumes

Location	ADT
Flynn Road	N/A
Wright Road West of Hwy 180 (1969 count)	629
McCloskey Road at Highway 156	1,591
McCloskey Road at Fairview Road	731
Buena Vista Road - West City Limits	845
Santa Ana Road at San Benito St.	4,403
South St. West of San Benito St.	2,070
South St. East of San Benito St.	4,643
Hillcrest Road East of McCray St.	1,971
Nash Road West of Powell St.	2,208
Sunnyslope Road at Prospect	3,044
Line St. North of 4th St.	808
Line St. South of 4th St.	2,311
Prospect Road North of Sunnyslope Rd.	4,250
Memorial Drive	N/A
Fairview Road at Spring Grove Road	1,638
Fairview Road at Airline Hwy.	3,800

Hollister Airport. Hollister has a general aviation airport located about 2½ miles north of the center of the city. It has an east-west runway of 4,350 feet and a north-south runway of 4,020 feet and is capable of handling medium sized jet aircraft.

The excellent year round climate of the Hollister area which furnishes many clear days during the period when airports to the north are frequently closed in with fog has made it useful on numerous occasions as an alternate landing field.

Transit and Transportation. Two types of transit service are available. One is operated by the city and is called San Tran and uses the dial-a-ride system.

A passenger wishing to use it places a telephone call to the transit headquarters and the bus then picks up the passenger at the place designated and takes the passenger to any other place within a two mile radius of the center of the city for a charge of 50¢. For destinations outside the service area there is an additional charge of 30¢ a mile.

This same system also runs on a fixed route between Hollister, San Juan and Tres Pinos. On Monday, Wednesday and Friday runs are made to San Juan at nine, twelve and three o'clock. On Tuesday and Thursday at the same hours passengers may go to Tres Pinos. There is a flat charge for this service of 50¢.

In addition to this local service the area is also served by the Greyhound Lines. Two buses each day each way carry passengers between San Francisco and Pacific Grove stopping at Hollister on the way.

Trucking is the main source of transportation which consists primarily of agricultural produce. Much of this produce is destined to canneries operated in Hollister, and in trucking the finished product away from the canneries to the metropolitan centers. Trucking of minerals is also an important item.

The only rail transportation is a single freight train a day which is operated by the Southern Pacific Railroad on a branch line which ends at Hollister and which runs north and joins the San Francisco-Los Angeles main line of the railroad at Carnadero Junction, two miles south of Gilroy.

Nonmotorized Transportation. There is only one bikeway in the area and that is in the City of Hollister. It runs along Prospect Avenue and Airline Highway between Hawkins Street and Sunset Drive.

The only pedestrian facilities are the paved sidewalks in the urban area of Hollister.

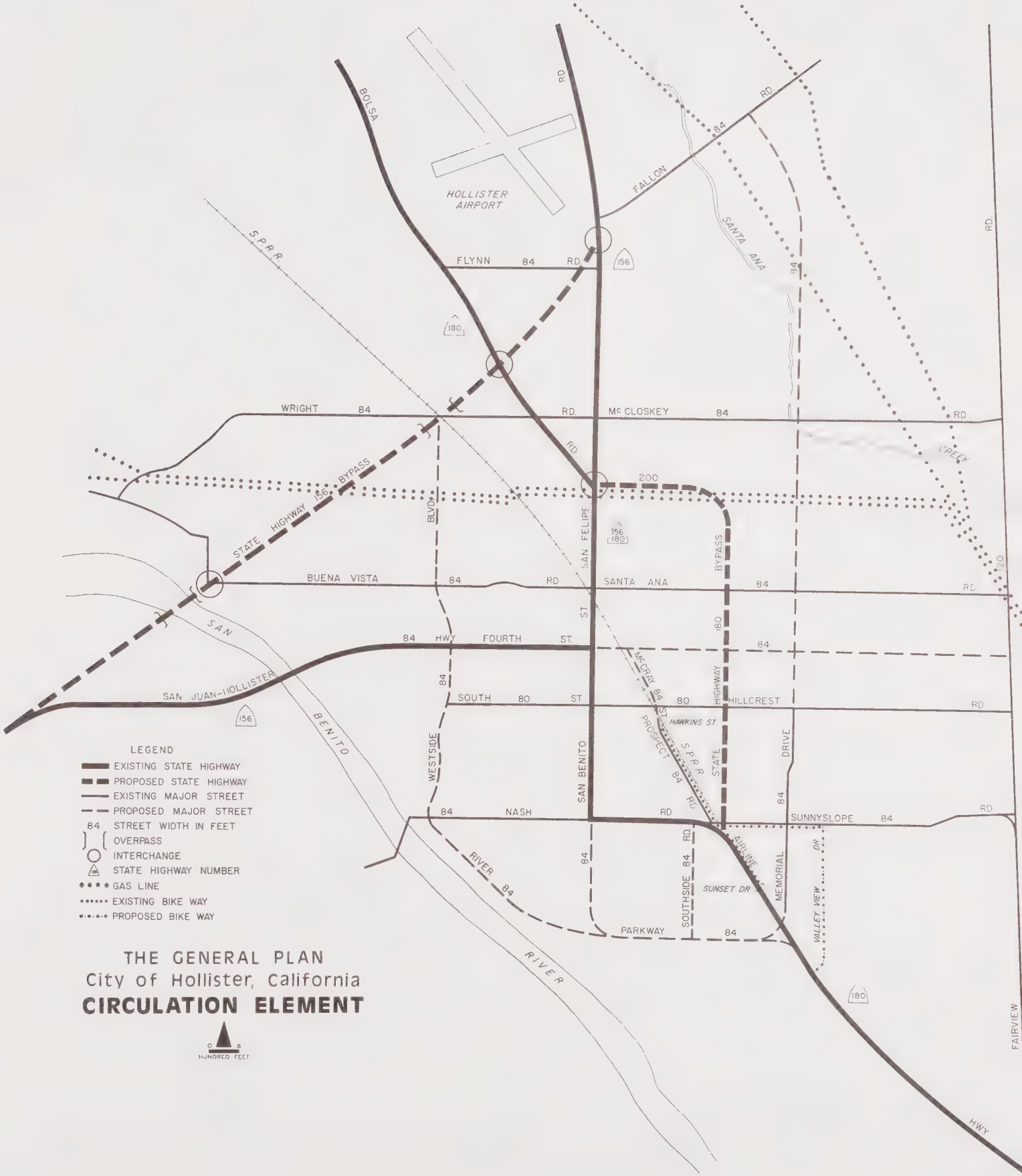
Major gas transmission lines of the Pacific Gas & Electric Company pass through the planning area in both north-south, and east-west directions. This company also has electric transmission lines. The Pacific Telephone Company has both above ground and underground facilities.

1976

Circulation Element

of the

Hollister Planning Area



THE GENERAL PLAN
City of Hollister, California
CIRCULATION ELEMENT

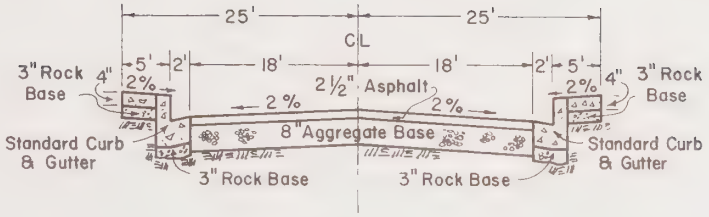
Circulation Element. The 1976 Hollister Planning Area Circulation Element of the General Plan is shown on the facing page. As can be seen by comparing it with the existing element it is substantially different and when adopted will make possible the achievement of items 11 and 12 of the objectives, goals and policies which were adopted by resolution of the Hollister Planning Commission and City Council in August 1975. These are:

> "11. Through traffic now entering the City of Hollister on State Highways should bypass the city.
>
> "12. A circulation system should be provided in an outer loop around the city and an inner loop around the downtown area with connection to the Sunnyslope area and to the State bypass routes."

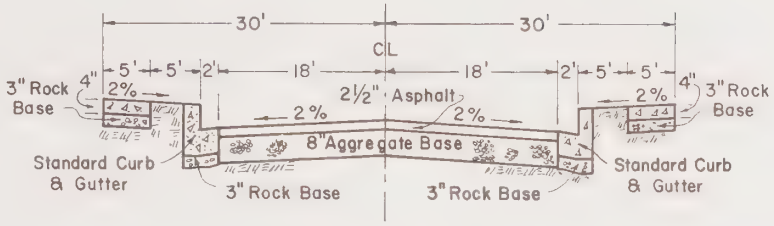
In reviewing this element it should be kept in mind that with respect to streets and highways only state highways and major streets, together with their proposed extensions are shown.

All of the major streets under local jurisdiction are to have an ultimate uniform width of 84 feet, with the exception of the Hillcrest Road-South Street combination which will be 80 feet; and Fairview Road which is planned for 120 feet. The state highways will be of varying width depending on topography, but normally, on level land, 200 feet wide.

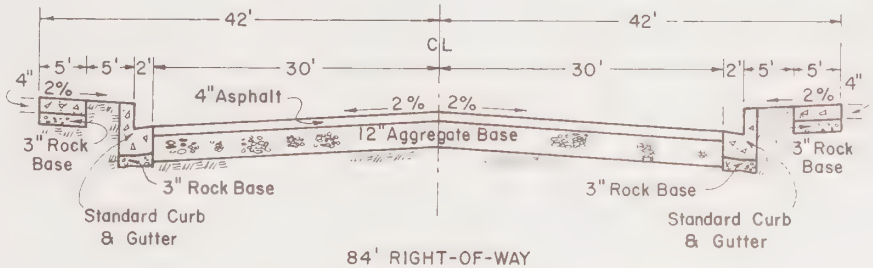
The element proposes a parkway and a boulevard which will have somewhat different street cross sections than the other major streets. The standard cross sections proposed are shown facing page 9.



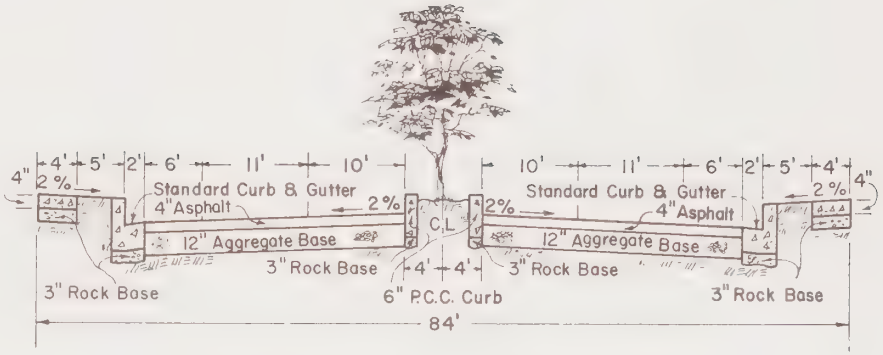
50' RIGHT-OF-WAY



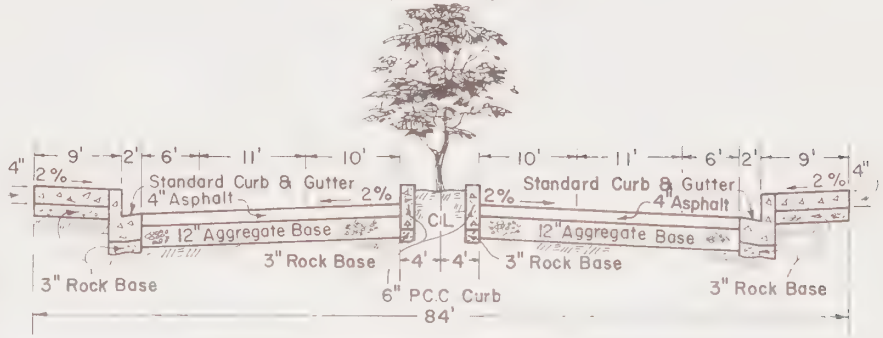
60' RIGHT-OF-WAY



84' RIGHT-OF-WAY



BOULEVARD RIGHT-OF-WAY
(Residential)



BOULEVARD RIGHT-OF-WAY
(Commercial)

CITY OF HOLLISTER
TYPICAL STREET SECTIONS

0 5 10
FEET

State Highways. Two major changes are proposed in the state highway system. One of these is in the current Circulation Element and another is an entirely new concept.

Shown on the 1969 Element was a bypass for Highway 156 which at that time was somewhat to the east of the present proposal. Current planning by the California Department of Transportation is to start this bypass at the curve in the San Juan-Hollister Highway which is west of the San Benito River Bridge. It would cross Buena Vista Road at its right angle turn and continue on to an overcrossing of the intersection of West Side Boulevard and Wright Road at the Southern Pacific Railroad crossing. It would then cross Bolsa Road and on a slight curve to the west intersect the present Highway 156 in the vicinity of Flynn Road. There would be interchange structures at the present Highway 156, on Bolsa Road, and at Buena Vista Road.

Through traffic, mostly of a commercial nature such as heavy trucks, would thus be removed from traversing the central district of Hollister as well as a portion of its residential district and its civic center.

An entirely new proposal is to develop a bypass for State Highway 180. This would start at an interchange on San Felipe Road at Bolsa Road and proceed due easterly about three-quarters of a mile and then curve due south and connect with the present 180 highway in the vicinity of the intersection of Sunnyslope Road, Airline Highway and Prospect Road.

Major Streets. The extension of Fourth Street due easterly to Fairview Road and the extension northerly of Memorial Drive to Fallon Road are similar to the proposals made in the 1969 General Plan.

The extension southerly of San Benito Street to the River Parkway and the inclusion of South Side Road between Nash Road and the Parkway are new proposals in this plan. It is also proposed to connect Prospect Road with McCray Street requiring a rail crossing near Hillcrest Road.

The 1969 plan proposed that a parkway be constructed along the San Benito River beginning at Fairview Road and continuing to an intersection with the State Highway 156 bypass. This no longer appears to be a feasible route because of the decision by the State Department of Transportation to build the 180 bypass instead. Therefore a much more modest proposal is made.

This is to construct the River Parkway which would begin at the intersection of Memorial Drive and Airline Highway and parallel Nash Road about one-half a mile south to a point where it would turn and run northwesterly along the bank of the San Benito River to an intersection with Nash Road.

It would then change its parkway character and become more of a boulevard type roadway and run in a generally northerly direction to an intersection with Highway 156 bypass.

All of these proposals can reasonably be achieved within the next two decades through cooperation between San Benito County and the City of Hollister. One important step which has already been taken in many instances is the adoption of official plan line maps which should preserve the rights-of-way until construction can begin.

Hollister Airport. The extension of the north-south runway at the Hollister Airport was first shown on the 1969 General Plan. This still has not been done due to lack of funding. This item is being continued in the plan, but it appears from a study made by the California Transportation Agency that funding will not be feasible prior to the decade between 1985 and 1995.

This runway extension will also require the construction of additional taxi or apron area. The report suggests that the land acquisition and construction be carried out during the 1980-85 period when it is estimated that the cost will be about $475,000. In the later decade when the north-south runway extension is constructed, it will be necessary to resurface the east-west runway and the cost of these improvements is estimated at $900,000.

The report recommends that during the 1977-78 fiscal year that both runways and their taxi areas should be resurfaced. In the following year right-of-way acquisition for the approach areas should be undertaken and in the 1979-80 fiscal year a fence should be constructed around the perimeter of the field. The total cost of these improvements will be $315,000.

Utility Transmission Lines. Gas, electric and telephone transmission lines within the planning area are under the jurisdiction of private utility companies and plans for their future development are not available.

Bikeways. A joint project participated in by the City of Hollister and the State Transportation Agency has been the development of a bikeway extending along Prospect Avenue and Airline Highway between Hawkins Street and Sunset Drive. The City contributed the Prospect Avenue portion and the State the section along Airline Highway.

Another bikeway to be built in the 1978-79 fiscal year would run along Sunnyslope Road and Valley View Road to Airline Highway.

Beyond that time period no specific recommendation is made except that the program should be continued after further study for the most appropriate routes.

APPROVAL

I hereby certify that the attached General Plan Element for the City of Hollister, California was duly and regularly approved by Resolution No. 76-10 of the Planning Commission of the City of Hollister on the 22nd day of July, 1976.

s/ Larry Nicholson
Chairman of the Planning Commission
of the City of Hollister

ATTEST:

s/ Thomas E. Barry
Secretary of the Planning Commission
of the City of Hollister

ADOPTION

I hereby certify that the attached General Plan Element for the City of Hollister, California was duly and regularly adopted by Resolution No. 76-64 of the City Council of the City of Hollister on the 26th day of October, 1976.

s/ Alfred Ledford
Mayor of the City of Hollister

ATTEST:

s/ Frank D. Felice
Clerk of the City of Hollister

1976
AMENDMENT
TO THE
OPEN SPACE ELEMENT

1976 Amendment
To The Open Space Element of the General Plan
Of the City of Hollister, California

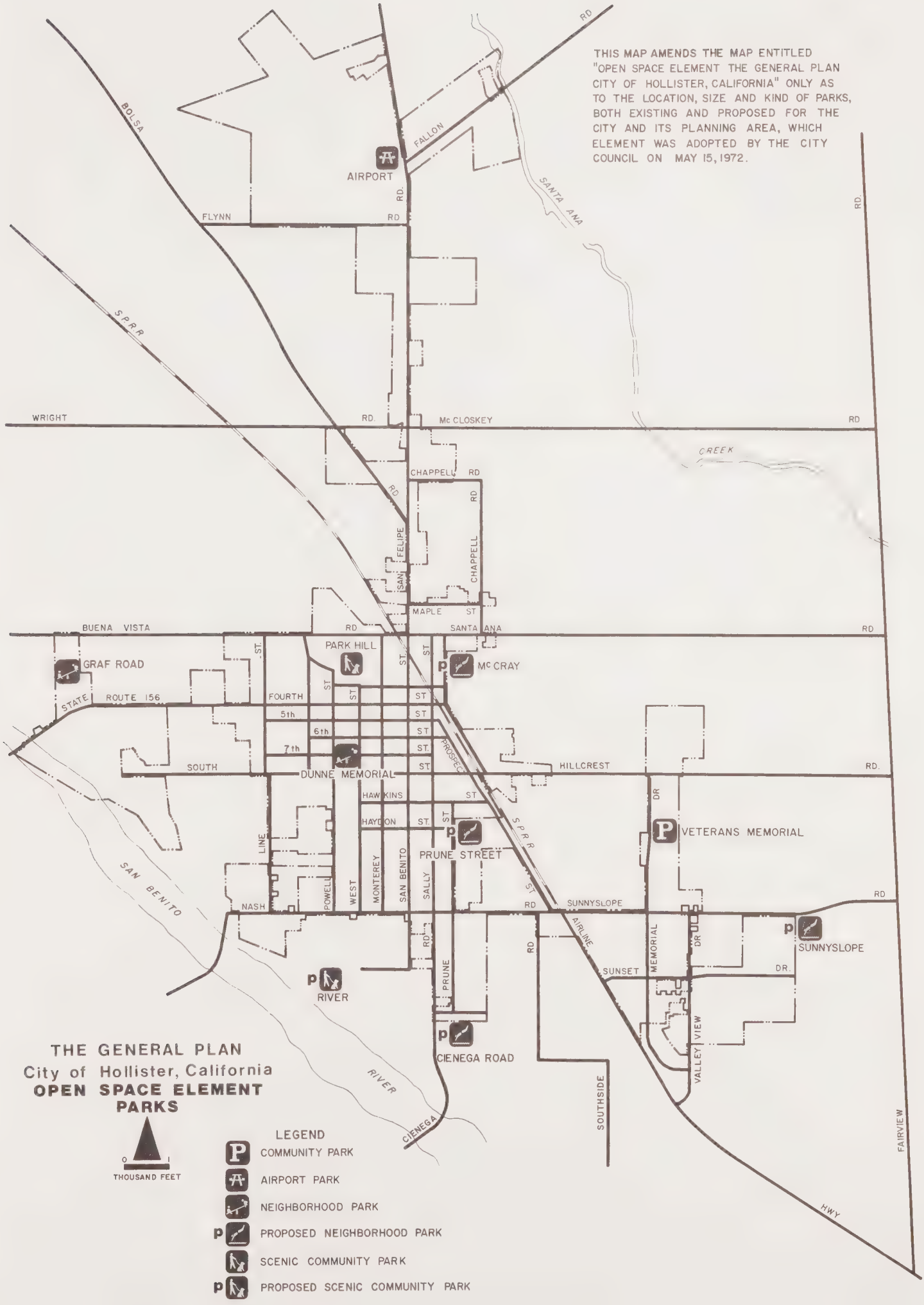
On March 23, 1972 the Hollister Planning Commission approved and recommended to the City Council the adoption of an Open Space Element of the General Plan. This element was approved and adopted by Resolution of the City Council on May 15, 1972.

As a part of the 1976 General Plan study it was decided that some review should be made of the Open Space Element in the light of new population predictions and changed conditions. As a result it is proposed to add to two existing neighborhood parks, four new ones bringing the total to six. In addition to these parks there are two scenic community parks, the one on Park Hill and a proposed one along River Parkway. Also retained in the plan is the existing Veterans Memorial Park. The existing and somewhat specialized two acre Airport Park is also in the plan. These parks and their approximate sizes are given in Table 1 which follows. One of the four new parks referred to is McCray Park which is an existing park formerly called Prospect Park.

Table 1

Existing and Proposed Parks
Hollister Planning Area

	Size in Acres		
	Existing	Proposed	Total
Neighborhood Parks			
Graf Road	1.0		
Dunne Memorial	7.0		
Cienega Road		4.8	
McCray		5.7	
Prune Street		5.3	
Sunnyslope		3.7	27.5
Scenic Community Parks			
Park Hill	10.0		
River		28.0	38.0
Community Parks			
Veterans Memorial	50.0		50.0
Other			
Airport Park	2.0	____	2.0
Total	70.0	47.5	117.5


THIS MAP AMENDS THE MAP ENTITLED "OPEN SPACE ELEMENT THE GENERAL PLAN CITY OF HOLLISTER, CALIFORNIA" ONLY AS TO THE LOCATION, SIZE AND KIND OF PARKS, BOTH EXISTING AND PROPOSED FOR THE CITY AND ITS PLANNING AREA, WHICH ELEMENT WAS ADOPTED BY THE CITY COUNCIL ON MAY 15, 1972.
AIRPORT
FALLON RD.
SANTA ANA
BOLSA
FLYNN RD
S.P.R.R.
WRIGHT RD.
Mc CLOSKEY RD
CREEK
CHAPPELL RD
SAN FELIPE RD
CHAPPELL RD
MAPLE ST
BUENA VISTA RD
SANTA ANA RD
PARK HILL
GRAF ROAD
Mc CRAY
STATE ROUTE 156
FOURTH ST
5th ST
6th ST
7th ST
SOUTH ST
DUNNE MEMORIAL
HILLCREST RD.
HAWKINS ST
HAYDON ST
PROSPECT ST
PRUNE STREET
VETERANS MEMORIAL
LINE ST
POWELL ST
WEST ST
MONTEREY ST
SAN BENITO ST
SALLY ST
NASH RD
SUNNYSLOPE RD
AIRLINE HWY
MEMORIAL DR
SUNNYSLOPE
SUNSET DR.
PRUNE RD
RIVER
CIENEGA ROAD
VALLEY VIEW
SOUTHSIDE
FAIRVIEW
SAN BENITO RIVER
CIENEGA
THE GENERAL PLAN
City of Hollister, California
OPEN SPACE ELEMENT
PARKS
0 1 THOUSAND FEET
LEGEND
COMMUNITY PARK
AIRPORT PARK
NEIGHBORHOOD PARK
PROPOSED NEIGHBORHOOD PARK
SCENIC COMMUNITY PARK
PROPOSED SCENIC COMMUNITY PARK

A map showing the location and the kind of park proposed as an amendment to the original Open Space Element is on the facing page. As was pointed out in the text in the 1972 Element a guide issued in 1956 by the California Committee on Planning for Recreation, Park Areas and Facilities, after exhaustive study of park needs in California, is called "Guide for Planning Recreation Parks in California" which is regarded as the most authoritative information on this subject available today. The report covers the time period between 1956 and 1975. For a complete discussion of the methods used to develop the standards set forth in the guide the 1972 Element text should be referred to.

Briefly, the Guide indicated that in a city having the residential density of Hollister and its location in California that there should be eight acres of neighborhood parks for every 3,000 population. This is one acre for every 375 people.

Existing and proposed neighborhood park areas total 27.5 acres. On a state guide basis this would provide for 10,312 people. This is more than ample for the present 8,575 population of the city and slightly under what the guide provides for the 12,000 people in the planning area.

However there should be taken into account that at least two of the other three major parks in the city, Veterans Memorial Park with 50 acres and River Park with 28 acres more than make up the deficiency which might be concluded exists under the strictly neighborhood theory.

The Guide indicates that each community size park will serve from 5,000 to 15,000 persons. It also suggests 38 acres as the proper size. The Hollister planning area's two scenic community parks have an aggregate total acreage of 38 which is precisely the amount required. In addition to this Veterans Memorial Park is designed as a community facility and its acreage of 50 is far above that required by the State Guide.

APPROVAL

I hereby certify that the attached General Plan Element for the City of Hollister, California was duly and regularly approved by Resolution No. 76-10 of the Planning Commission of the City of Hollister on the 22nd day of July, 1976.

s/ Larry Nicholson
Chairman of the Planning Commission
of the City of Hollister

ATTEST:

s/ Thomas E. Barry
Secretary of the Planning Commission
of the City of Hollister

ADOPTION

I hereby certify that the attached General Plan Element for the City of Hollister, California was duly and regularly adopted by Resolution No. 76-64 of the City Council of the City of Hollister on the 26th day of October, 1976.

s/ Alfred Ledford
Mayor of the City of Hollister

ATTEST:

s/ Frank D. Felice
Clerk of the City of Hollister

SCENIC HIGHWAYS ELEMENT

Table of Contents

Foreword. The idea of designating certain roadways which traverse areas of scenic beauty, or which connect individual features having scenic value, as scenic highways is not a new one in California. Nearly 40 years ago Santa Clara County pioneered in establishing scenic zones along Skyline Boulevard, Pacheco Pass Highway and Hecker Pass Highway.

In 1963 the California Legislature established "official state scenic highway" designations. The Master Plan of State Highways eligible for this classification covers 6,406 miles of the approximately 16,800 mile state highway system.

It was the intent of the 1963 legislation to encourage local jurisdictions to request such designations. Administration and coordination of the program are the responsibility of the Transportation Agency of California which works with an advisory committee whose members are appointed by the Governor.

The committee has worked out facility planning, design criteria and standards. Originally, a local government who wanted to participate was required to adopt its own Scenic Highways Plan and a program of plan implementation which would result in the protection and enhancement of natural and man-made scenic resources - in short - the visual environment.

The original program was a voluntary one but more recently state planning legislation requires each county in California to prepare a Scenic Highways Element as a part of its General Plan.

Scenic highway planning can be done on either of two levels. A local government can request that the State Transportation Agency designate certain state highways within its jurisdiction as scenic highways in the State Plan. Thereafter, all development along such highways would have to be in conformance with certain minimum requirements set forth in the state law. Local zoning and local regulations could not be in conflict with the standards set by the state.

The second method allows the local agency to establish a system of scenic highways with regulations adopted as a part of the Zoning Ordinance. The control is thus kept within the local jurisdiction. These two alternatives are explained in a paragraph contained in a letter written by Mark A. Parreira, chairman, Scenic Highway Advisory Committee of California, to the San Benito County Scenic Highway Subcommittee, dated October 8, 1973 as follows:

> "The statutes under which the California Scenic Highway Program operates does stipulate minimum requirements that must be met with regard to the State designation of official scenic highways (Section 261, Streets & Highways Code). Thus, if a local government authority wants State designation of a particular highway, whether it be a State highway or County road, then it must comply pursuant to that State law. As with any law, the Statutes could be revised making the rules and regulations more (or less) stringent. If such were to happen and the county's designated highways no longer met the new minimum criteria then the official State designation would be removed. The County could still call it a County Scenic Highway and commemorate it by whatever other method they saw fit. The 17-Mile Drive, in Monterey County, although not a public road, would be an example.

"In other words, counties can have scenic highways which comply with the criteria in their own Scenic Highways Elements but which do not have 'official' State recognition as scenic highways."

The important difference is that a scenic highway system which is not recognized by the state will not be marked with the familiar scenic highway poppy sign and will not be shown upon maps of its scenic highways issued by the state.

Alpine County was the first California county to obtain official state scenic highway designations for all of the state highways within the county. This was a total of 81.6 miles, including all of state routes 4, 88 and 89.

The matter of designating scenic highways for San Benito County and its two cities is relatively recent. In 1970 the Transportation Agency District Office (then called the Division of Highways) recommended to the Board of Supervisors that routes 25 and 180 from Hollister to the Monterey County line and route 146 and route 25 to the Pinnacles National Monument be designated as state scenic highways.

Because this concept was a relatively new one to landowners in the county area they suggested to the Board of Supervisors that the matter should have further study. The principal objection on the part of the agricultural community was that the state might apply what would amount to zoning regulations on all of the designated highways which might be so severe as to affect normal farming operations. There was no objection to the idea of scenic highways as such, but only to the enforcement of the necessary rules being handled by a group relatively remote from the county.

The matter was studied during the preparation of the Scenic Highways Element to the county plan which was made in 1973. As a result the county now has its own Scenic Highways Plan and "SH" Scenic Highways Combining District as a part of its recently adopted Zoning Ordinance. The Hollister Scenic Highways Element is coordinated with the County's Element.

Scenic Highways, Hollister Planning Area. Existing scenic highways in the Hollister Planning Area are:

1. State Highway 180 from the north boundary of the Planning Area to State Highway 156.

2. State Highway 156 from the north boundary of the Planning Area to its junction with State Highway 180.

3. State Highways 156 - 180 from their junction to Fourth Street.

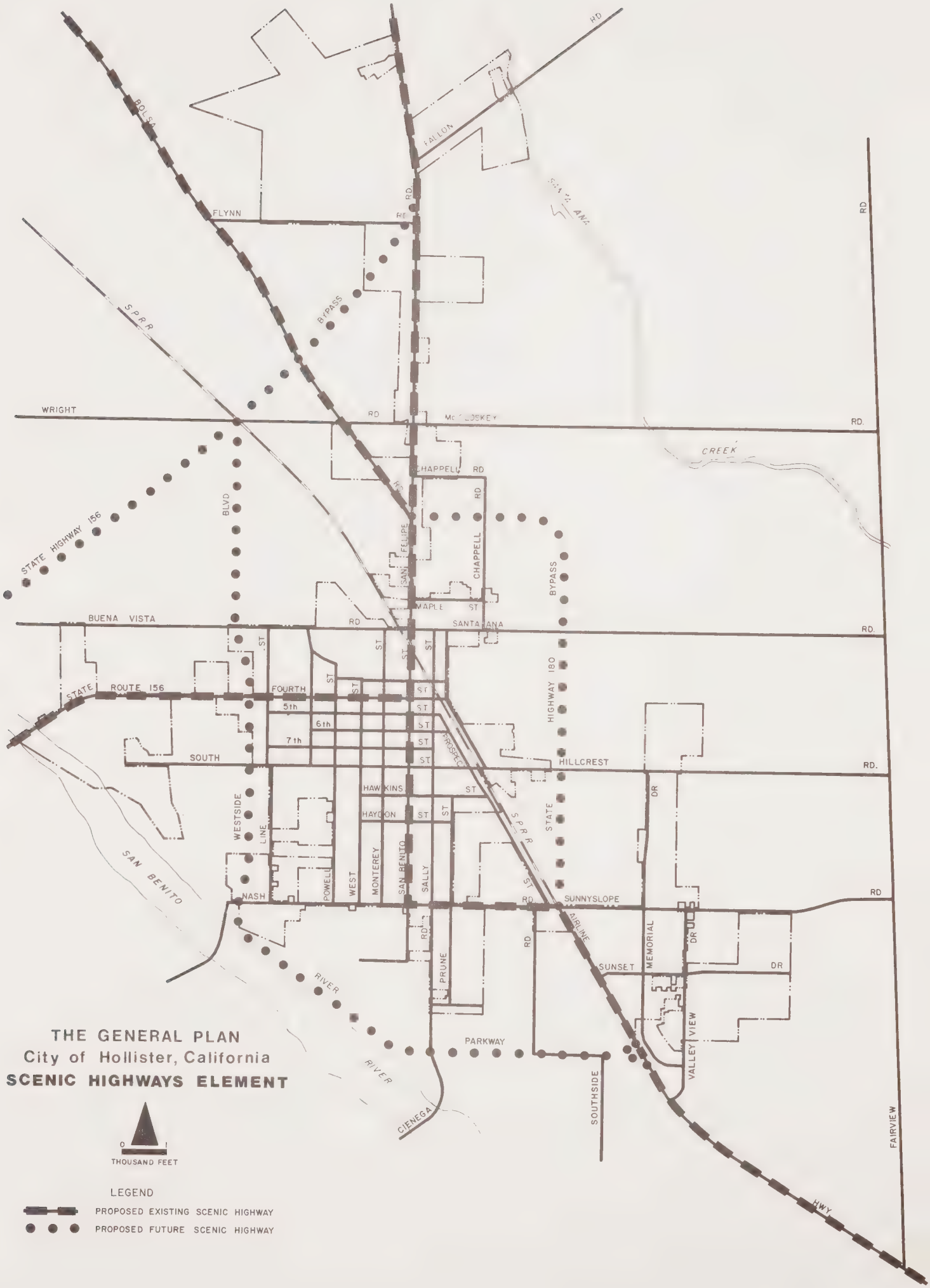
4. State Highway 156 from San Benito Street to the westerly boundary of the Planning Area.

5. State Highway 180 from Fourth Street to Fairview Road.

Proposed future scenic highways are as follows:

6. State Highway 156 By-pass from its junction with the San Juan-Hollister Highway to its junction with San Felipe Road approximately 1500 feet south of Fallon Road.

7. State Highway 180 By-pass from its junction with State Highway 156 approximately 1800 feet south of McCloskey Road to its junction with the existing State Highway 180 at Sunnyslope Road.


THE GENERAL PLAN
City of Hollister, California
SCENIC HIGHWAYS ELEMENT
0
1
THOUSAND FEET
LEGEND
PROPOSED EXISTING SCENIC HIGHWAY
PROPOSED FUTURE SCENIC HIGHWAY
BOLSA
FALLON
RD.
FLYNN
RD
SANTA ANA
S.P.R.R.
BYPASS
WRIGHT
RD
McCLOSKEY
RD.
CREEK
CHAPPELL
RD
RD
SAN FELIPE
CHAPPELL
BYPASS
STATE HIGHWAY 156
BLVD
WAPLE
ST
BUENA VISTA
RD
SANTA ANA
RD.
ST
ST
ST
ST
STATE
ROUTE 156
FOURTH
5th
6th
7th
ST
ST
ST
ST
ST
HIGHWAY 180
SOUTH
HILLCREST
RD.
PROSPECT
HAWKINS
ST
HAYDON
ST
ST
DR
WESTSIDE
LINE
STATE
S.P.R.R.
SAN BENITO
NASH
POWELL
WEST
MONTEREY
SAN BENITO
SALLY
ST
RD
SUNNYSLOPE
RD
AIRLINE
RD
RD
PRUNE
SUNSET
MEMORIAL
DR
DR
DR
RIVER
RIVER
PARKWAY
VALLEY
VIEW
SOUTHSIDE
CIENEGA
FAIRVIEW
HWY

8. River Parkway from Airline Highway to Nash Road.

9. Westside Boulevard from Nash Road to State Highway 156 By-pass.

The Scenic Highway Element of the Hollister General Plan is shown on the facing page.

Regulations. Regulations for scenic highways in the past have normally been based on the theory that they usually traverse open and unspoiled country thus, relatively wide corridors on each side of the center line of the highway are established for the scenic highway zone. The San Benito County corridor, for example, is 500 feet on each side of the highway center. Such corridors are not feasible in urbanized areas and must be modified.

In the Hollister planning area it is not feasible to establish a scenic highway corridor on any of the existing highways with the possible exception of Highway 180 north of Wright Road. A corridor is feasible on the proposed State Highway 156 By-pass between the San Juan Highway and existing State Route 156 near the Hollister Airport. One is also feasible along the proposed River Parkway between Airline Highway and the proposed Westside Boulevard. The proposed State Highway 180 By-pass is not suitable for a scenic highway corridor.

Although San Benito County uses a 500-foot strip on each side of the highway center line for its corridors, the Hollister area corridor should be 200 feet wide on each side. After this General Plan is adopted it will have to be followed by a revision of the Zoning Ordinance and at that time regulations within the scenic highway corridor can be established under a special combining zone designated :SH. For example, if the highway traverses a commercial area the designation would be C-1:SH.

For those streets where corridors are not feasible special landscaping treatment would be provided. One type of treatment is that proposed for Westside Boulevard which is shown in cross section opposite page 9 in the Circulation Element of this plan. One cross section is to be used for residential areas and another for commercial zones.

For the balance of the streets designated as scenic highways a more limited type of treatment will have to suffice. This will consist of street trees, some ornamental shrubbery, benches where appropriate, attractive waste receptacles and the like. In the more heavily urbanized areas a program of placing all wiring underground would greatly improve the appearance of the streetscape.

A cooperative program with San Benito County should be worked out to produce a design for a highway marker to be placed along the scenic highways in both the county and the city. This will serve the dual function of advising the traveling public of the scenic values of the area and, hopefully, would enlist their cooperation in keeping the roadway corridor free from litter.

APPROVAL

I hereby certify that the attached General Plan Element for the City of Hollister, California was duly and regularly approved by Resolution No. 76-8 of the Planning Commission of the City of Hollister on the 27th day of May, 1976.

s/ Larry Nicholson
Chairman of the Planning Commission
of the City of Hollister

ATTEST:

s/ Thomas E. Barry
Secretary of the Planning Commission
of the City of Hollister

ADOPTION

I hereby certify that the attached General Plan Element for the City of Hollister, California was duly and regularly adopted by Resolution No. 76-64 of the City Council of the City of Hollister on the 26th day of October, 1976.

s/ Alfred Ledford
Mayor of the City of Hollister

ATTEST:

s/ Frank D. Felice
Clerk of the City of Hollister

CONSERVATION ELEMENT

Table of Contents

Foreword. The City of Hollister is the county seat and the commercial and industrial center of San Benito County. It shares in the economic base of the county which is dependent upon two prime natural resources - rich agricultural soils and extensive mineral deposits. The mineral deposits are nonrenewable but they exist in such abundance that they will be an asset and a support to the economy for many generations to come.

What may not be too obvious is that the rich agricultural base can also become a nonrenewable asset if the city does not control its urban growth and confine it within reasonable limits such as the planning area which has been delineated by the City Council. As was pointed out in the 1973 Conservation Element of San Benito County "The management of natural resources for the benefit of man by providing for their continual renewal, or replacement with other beneficial environmental resources is the special function called conservation."

Legal Basis. Section 65302 of the Government Code of California provides:

> "65302. The general plan shall consist of a statement of development policies and shall include a diagram or diagrams and text setting forth objectives, principles, standards, and plan proposals. The plan shall include the following elements:....
>
> "(d) A conservation element for the conservation, development, and utilization of natural resources including water and its hydraulic force, forests, soils, rivers and other waters, harbors,

fisheries, wildlife, minerals, and other natural resources. That portion of the conservation element including waters shall be developed in coordination with any countywide water agency and with all district and city agencies which have developed, served, controlled or conserved water for any purpose for the county or city for which the plan is prepared. The conservation element may also cover:

"(1) The reclamation of land and waters.

"(2) Flood control.

"(3) Prevention and control of the pollution of streams and other waters.

"(4) Regulation of the use of land in stream channels and other areas required for the accomplishment of the conservation plan.

"(5) Prevention, control, and correction of the erosion of soils, beaches, and shores.

"(6) Protection of watersheds.

"(7) The location, quantity and quality of the rock, sand and gravel resources."

A careful reading of this portion of the Government Code reveals that certain items of this element are mandatory and others may or may not be included. These are designated as permissive.

When the two different categories are listed separately the following table results:

TABLE 1

CONSERVATION ELEMENT

Conservation, development and utilization of natural resources (M)

a. Water and its hydraulic force (M)
b. Rivers and other waters (M)
c. Forests (M)
d. Soils (M)
e. Harbors (M)
f. Fisheries (M)
g. Wildlife (M)
h. Minerals (M)
i. Other natural resources (M)

That portion of the conservation element including waters shall be developed in coordination with any county-wide water agency and all district and city agencies in the county.

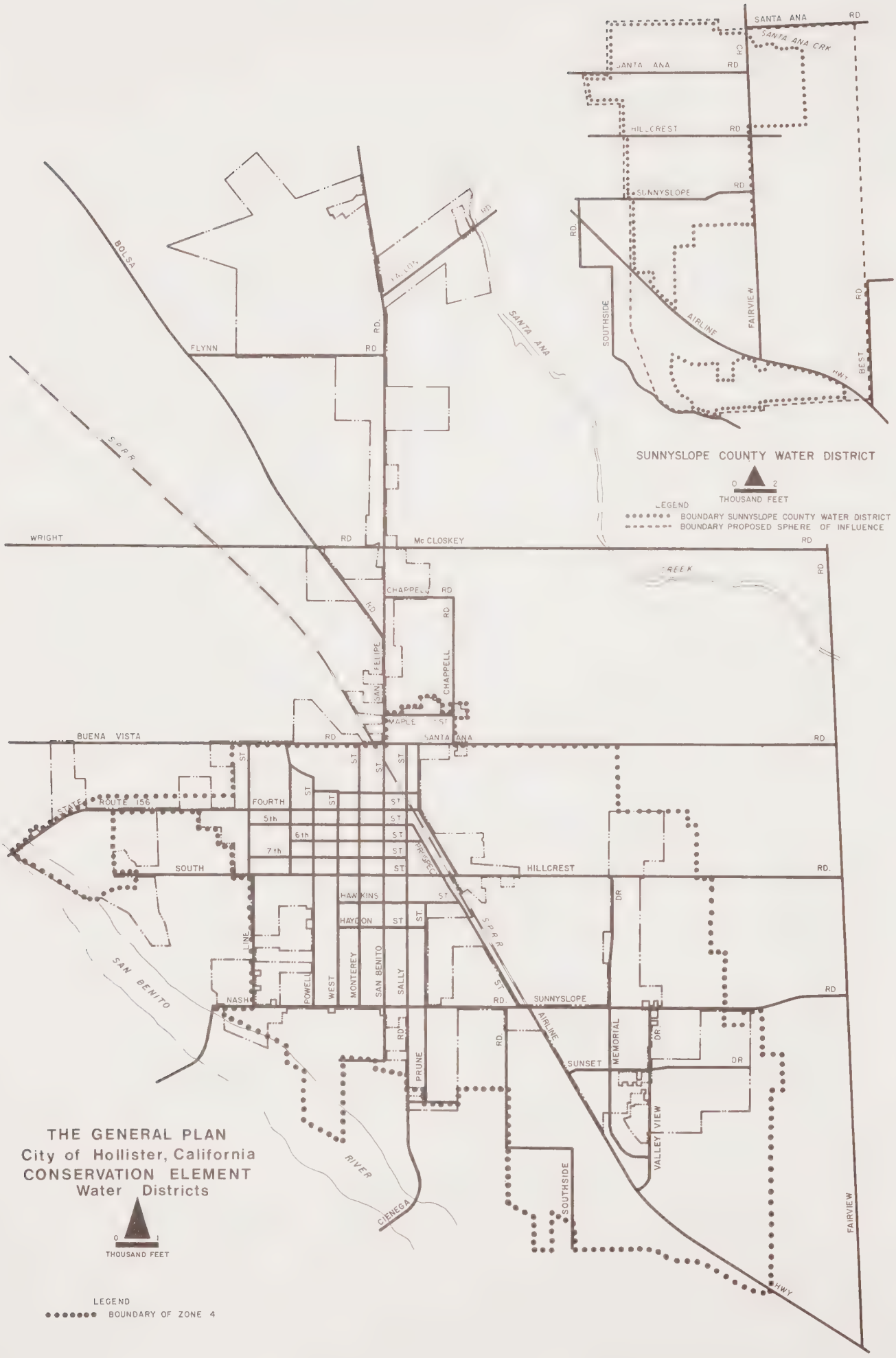
j. Reclamation of land and waters (P)
k. Flood control (P)
l. Prevention, control of pollution of streams and waters (P)
m. Regulation of land use in stream channels and other areas required for conservation plan (P)
n. Prevention, control, and correction of the erosion of soils, beaches, shores (P)
o. Protection of watersheds (P)
p. Location, quantity, quality of rock, sand, gravel (P)

Water. The city water supply is pumped from the underground water table into which five wells have been drilled. Two 2,000,000 gallon tanks provide storage. Areas outside the city, but within the planning area, are presently substantially undeveloped and the water supply is partially from individual wells which are primarily used for agriculture, and from the water system of the Sunnyslope County Water District.

The underground water table is replaced by natural rainfall during the winter months. Two water courses of which the San Benito River is the principal one run through the Hollister area. The other is Santa Ana Creek.

These water courses run through gravelly soil which in periods of heavy rainfall results in water percolating through the gravel into the underground water table.

Water Districts. Two special districts have been involved in supplying water to the Hollister area. One of these is the Countywide Water Conservation and Flood Control District and the other is the Sunnyslope County Water District. The Countywide District was formed in 1953 when the local agricultural community first became aware that an imbalance might develop between the amount of water withdrawn from the underground water table and the amount of water replaced by rainfall. The district developed conservation methods including the construction of two reservoirs and a system of canals.


SANTA ANA RD
SANTA ANA CRK
SANTA ANA RD
HILLCREST RD
SUNNYSLOPE RD
SOUTHSIDE
AIRLINE
FAIRVIEW
BEST
HWY
SUNNYSLOPE COUNTY WATER DISTRICT
0 2
THOUSAND FEET
LEGEND
BOUNDARY SUNNYSLOPE COUNTY WATER DISTRICT
BOUNDARY PROPOSED SPHERE OF INFLUENCE
BOLSA
FLYNN RD
S.P.R.R.
SANTA ANA
WRIGHT RD
Mc CLOSKEY RD
CREEK
CHAPPELL RD
SAN FELIPE RD
CHAPPELL
MAPLE ST
BUENA VISTA RD
SANTA ANA RD
STATE ROUTE 156
FOURTH
5th
6th
7th
SOUTH
HILLCREST RD.
HAWKINS ST
HAYDON ST
LINE
SAN BENITO
NASH
POWELL
WEST
MONTEREY
SAN BENITO
SALLY
PRUNE
SUNNYSLOPE RD.
AIRLINE
MEMORIAL DR
SUNSET DR
VALLEY VIEW
SOUTHSIDE
FAIRVIEW
HWY
RIVER
CIENEGA
THE GENERAL PLAN
City of Hollister, California
CONSERVATION ELEMENT
Water Districts
0 1
THOUSAND FEET
LEGEND
BOUNDARY OF ZONE 4

At the southern end of the county a reservoir site was located which could be used to collect water from several tributary streams and hold it for release during the summer months for percolation into the gravel beds in the northern end of the county. It is called Hernandez Reservoir.

A special zone was formed to finance, construct and operate that reservoir and also to finance and operate the Paicines Reservoir complex downstream.

The district was also instrumental in the reconstruction of the Paicines Canal and a diversion works on the San Benito River at the Bruce Hill Ranch. It also constructed an outlet from the Paicines Reservoir to Tres Pinos Creek so that water could be released for percolation to both the San Benito River and Tres Pinos Creek.

Sunnyslope County Water District. On the map on the facing page are the boundaries of the Sunnyslope County Water District which is located immediately to the south and east of Hollister and was formed for the purpose of supplying domestic water to an extensive residential development which has been constructed over the past 20 years. Curiously the District consists of two land areas which are separated from each other by nondistrict land. However, the District Directors ultimately intend to correct this situation and they have chosen an ultimate service boundary into which they expect to expand. This boundary is also shown upon the map. The proposed westerly boundary of the district, in some instances, extends to points which are close to the easterly boundary of the City of Hollister. The proposed easterly boundary of the district is a line parallel with and about one mile east of Fairview Road.


CANAL FROM SAN LUIS RESERVOIR
HOLLISTER PUMP STATION
ROAD
FOOTHILL
RD.
FAIRVIEW
RD
156
ORCHARD
VIBORAS
LOS
COMSTOCK
SPRING GROVE
ROUTE
STATE
SANTA ANA
FALLON
CREEK
BOLSA
S.P.R.R.
MAIN CONDUIT
TREE
LONE
FELIPE
SAN
WRIGHT
Mc CLOSKEY
SANTA ANA
BUENA VISTA
SAN BENITO
FOURTH
ST.
SAN BENITO
STATE
UNION
NASH
SUNNYSLOPE
RIVERSIDE
PIPELINE
RESERVOIR
CIENEGA
SOUTHSIDE
AIRLINE
FAIRVIEW
HWY.
RIVER
SAN JUSTO RESERVOIR
THE GENERAL PLAN
City of Hollister, California
CONSERVATION ELEMENT
San Felipe Project
0 2
THOUSAND FEET

In the portion of the Sunnyslope District which lies south of Airline Highway both sewer and water service have been extended by the district to a new development, Ridgemark, which is a combination of a golf course interspersed with residences.

Flood Control. In 1961 what is known as Zone 4 of the County Water Conservation and Flood Control District was established under the flood control provisions of the Act for the purpose of financing and constructing storm sewer systems in and around Hollister. The District has two storm drain systems, one on Nash Road, and the other on Apricot Lane. Zone 4 is also shown on the map.

San Luis Water. The U. S. Bureau of Reclamation has proposed as part of its Central Valley Project to construct facilities to provide water for Santa Clara, San Benito, Santa Cruz and Monterey Counties. These facilities are to be constructed as the San Felipe Division. Included are the Pacheco Tunnel and Pacheco Canal which are to carry water from San Luis Reservoir. That tunnel and canal are to be operated and maintained by the Santa Clara Valley Water District and the cost shared with the San Benito Water Conservation and Flood Control District. (See map facing page)

The Hollister Conduit, Hollister Pumping Station, and San Justo Reservoir are those parts of the San Felipe Division which are to supply the Project Area in the northern end of San Benito County. All the aforementioned are known as the Federal Facilities and will be financed and constructed by the Federal Government. That portion of the capital cost allocable to the delivery of water will be paid for through federal water charges. Responsibility and cost of operating, maintaining and replacing these facilities exclusive to San Benito County will be

borne by the District. The locations and sizes of the facilities to serve San Benito County as presently envisioned are the result of preliminary work by the Bureau of Reclamation and are subject to change.

Hollister Conduit. The conduit will begin as an open concrete lined canal where the Pacheco Canal bifurcates to the Santa Clara Conduit and Hollister Conduit. This canal will be approximately six miles long, terminating at the Hollister Pumping Station forebay (a small holding pond). The conduit will continue from the pumping station as a 51-inch cement-lined steel pipeline. The pipeline is to be 17 miles long, terminating at San Justo Reservoir. This conduit shall be furnished by the Federal Government.

Hollister Pumping Station. This pumping station will be capable of lifting 83 cubic feet per second from its forebay against the head created by San Justo Reservoir at maximum reservoir level. Energy for the pumping will be furnished by the Federal Government and the cost of the energy will be included in the federal water charges.

San Justo Reservoir. This reservoir will be created by an earth-fill dam. It will fill during the period of October through April and be drawn upon for supply from May to September. Its capacity is 11,000 acre-feet.

Operation. When the years of maximum system use arrive water will flow forward in the Hollister Conduit from the pumping station and backward from the reservoir to the turnouts during the months of heavy water use. At the end of the irrigation season, the reservoir will be at minimum operating pool and refilling will begin. Maximum operating pool will be attained at or before the beginning of the heavy use season.

Construction Schedule (Federal Facilities). The construction schedule anticipated for the federal facilities is:

Facility	Begin	Complete
Pacheco Tunnel, Pacheco Canal	1976	1981
Hollister Conduit, Hollister Pumping Station, San Justo Reservoir	1978	June 1982

Municipal and Industrial Distribution System. San Felipe water, as delivered to San Benito County, will be untreated water from San Luis Reservoir. That delivered directly for municipal and industrial purposes will require treatment, namely filtration and chlorination. No such treatment facilities exist now. Because of the higher quality of San Felipe treated water as compared to the present groundwater, it is anticipated such facilities will be built in Hollister. The proposed distribution system includes one pipeline to the anticipated receiving point of San Felipe water.

The City of Hollister presently has a steel storage tank on a hill about one-half mile east of the intersection of Fairview and Sunnyslope roads. The proposed system includes a pumping station at the Hollister Conduit and a pipeline to the tank location, anticipating a water treatment plant at that site.

Percolation. As soon as San Felipe water is available to San Benito County, it is intended to percolate enough to stop overdraft of the groundwater basin. This will be necessary since:

1. It will be a number of years before the desired number of agricultural users change from groundwater to the distribution system, and

2. It could be some years before Hollister builds a water treatment plant. Even then such users as the canneries will continue to use groundwater because it will cost less.

It is estimated that the maximum percolation will be 10,000 acre-feet per year. Half of this, 5,000 acre-feet per year, would be released at the turnout on Tres Pinos Creek nearest Tres Pinos. Assuming 200 days of the year available for percolation, this calculates to 12.6 cubic feet per second, which is what the pipeline supplying this turnout is sized for. The other 5,000 acre feet year would be turned out where the Hollister Conduit crosses the San Benito River.

In recent years there has been some doubt as to whether the tunnel could be completed due to environmental concerns and lack of funding by the Congress. However it appears that these problems have now been resolved. Congress has funded completion of the project into San Benito County and a construction field office has been opened at the Hollister Airport. A similar office has been opened in Santa Clara County.

Under the arrangement worked out with the Federal Government the water will become available both for agricultural and domestic use. Thus, the City of Hollister will no longer be dependent upon or limited in its economic development with respect to its water supply by the uncertainties of natural rainfall.

Underground storage will still be a part of the water supply system, but if experience in other areas is repeated in San Benito County the supplemental water will result in the underground storage basin returning to near its original water level.

Water Quality. The San Luis water will improve water quality in the city, both as to its general hardness and particular chemicals. The San Benito River watershed aquifers carry water which is high in dissolved salts as compared with the waters from the Pacheco Pass area. This hard water could be diluted with water from the Central Valley which is softer.

Along certain fault areas are found high concentrations of boron, an element injurious to plants at concentrations of ½ part per million or above. This is particularly true east of Fairview Road in the Hollister area.

At the time of the preparation of this element (April 1976) preliminary steps had been taken by the City of Hollister to withdraw from the San Benito County Water Conservation and Flood Control District, particularly with respect to the storm drainage function. Details on how the transfer of the district's functions to the City will be arranged and the time period involved is not known at this time.

Soils. The subject of soils in the Hollister area has been thoroughly covered in the Seismic Safety Element of the City General Plan. A detailed soils map faces page 13 of that element and a general statement about the geology in the area is on pages 13, 14 and 15. In addition a complete analysis of the characteristics of all of the soils within the Hollister Planning Area is contained in Appendix C on page 32 of the same element. Therefore, a discussion of soils is omitted here.

Rivers and Streams. There are two major water courses in the area. Santa Ana Creek which forms a portion of the northeast boundary of the planning area is a small water course which serves as a drainage channel during periods of moderate to heavy rainfall. San Benito River, which forms a portion of the southwest boundary is a relatively large stream which in periods of heavy storms carries water northwesterly through the area into the Pajaro River.

With the probable availability of imported water in the early 1980's the San Benito River has an excellent potential for becoming a scenic and recreational resource.

This is recognized in two other elements of this plan. In the Open Space Element a major park is proposed along its banks and a state highway bypass route together with a major city highway are designated as scenic highways in the Scenic Highways Element.

Minerals. The only substantial mineral deposit within the planning area is the sand and gravel in the San Benito River. Most of the river is under the jurisdiction of the county. For a considerable period of time the mining operations within the river bed were unregulated and became a cause of considerable concern because of damage being done to the percolation properties of these deposits. This problem has resulted in the development of a new County Ordinance regulating the excavation, prospecting, quarrying and mining operations. Permits are required, standards are outlined and operation plans and rehabilitation plans are required.

In those portions of the river under the jurisdiction of the City of Hollister the operations should be put on a sustained ore basis. Rather than digging many separate deep holes more longitudinal operations should be required so as to avoid silting up the percolation beds. There are many dangerous deep holes filled with water, unfenced vertical walls, undermining of properties and destroyed vegetation. Proper steps should be taken by the city to correct these deficiencies.

All new permits issued for gravel extraction operations should be subject to the approval of the Soil Conservation Service of the Federal Government. In addition complete zoning regulations should be adopted by the City to protect the integrity of the river in view of the future plans for the beautification of its banks.

Pollution Control. The pollution of water courses within the planning area is under the jurisdiction of the California Regional Water Quality Control Board for the Central Coast Region whose offices are located in San Luis Obispo. On April 19,1974 the Board adopted Order No. 74-40 entitled "Waste Discharge Requirements for City of Hollister, San Benito County."

In general these regulations allow the City of Hollister to discharge up to two million gallons of municipal waste water per day into a series of oxidation-percolation ponds located southwest of the San Benito River about two and one-half miles west of San Benito Street. These regulations are shown in Appendix A of this document.

Sand and Gravel Resources. As has been indicated previously the principal sand and gravel deposits within the planning area are in the San Benito River. The quantity within the Hollister Planning Area of these minerals is not known, and the matter may be academic in any event because of the plan to locate a major park along the banks of the river.

Conclusions. It is concluded that:

1. The City should continue to work with other public agencies of the region to insure the completion of the San Luis Federal Project so that a firm water supply for the area will be assured.

2. Local sources of water supply should continue to be explored and developed, including works which will enhance the underground reservoir.

3. Certain soil types in the planning area are unstable. Adequate soil reports should be furnished as a part of any proceeding which would culminate in residential or other development of structures.

4. Strict control of gravel and sand extraction methods should be exercised. The leaving of deep and separated holes in stream beds should not be permitted.

APPENDIX A

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION
2238 Broad Street
San Luis Obispo, California

ORDER NO. 74-40

WASTE DISCHARGE REQUIREMENTS
FOR
CITY OF HOLLISTER, SAN BENITO COUNTY

The California Regional Water Quality Control Board, Central Coast Region, finds:

1. The City of Hollister proposes to discharge up to 2.0 million gallons of municipal wastewater per day to a series of oxidation-percolation ponds located southwest of the San Benito River about 2½ miles west of San Benito Street.

2. The present treatment plant has a design capacity of 1,000,000 gallons per day and will be abandoned.

3. The Board adopted an Interim Water Quality Control Plan for the Central Coastal Basin on June 10, 1971.

4. The beneficial uses of ground waters in the vicinity of the discharge include:

    a. Agricultural water supply
    b. Domestic water supply
    c. Industrial water supply

5. The discharge has been subject to discharge requirements adopted by the Board on May 18, 1973.

6. The Board has notified the discharger and interested agencies and persons of its intent to revise waste discharge requirements for the discharger.

7. The Board, in a public hearing on April 19, 1974, heard and considered all comments pertaining to the discharge.

APPENDIX A
ORDER 74-40

IT IS HEREBY ORDERED, the City of Hollister shall comply with the following:

A. Discharge Specifications

1. The discharge shall be maintained on the designated disposal area without overflow or bypass to the San Benito River or adjacent properties.

2. The maximum daily dry weather volume discharged shall not exceed 1,000,000 gallons until the proposed new facilities are completed. After the new plant is completed the maximum daily dry weather volume discharged shall not exceed 2,000,000 gallons.

3. Effective March 1, 1976, the discharge shall not contain constituent concentrations in excess of the following limits:

Constituent	Units	Median	Maximum
Total Dissolved Solids	mg/l	Water supply + 300	1200
Sodium	"	" " + 70	250
Chloride	"	" " + 75	250
Sulfate	"	" " + 30	250
Total Nitrogen (asN)	"	" " + 5	30
Total Hardness	"	" " + 80	450
Boron	"	" " + 0.2	1.5

4. The public shall not have contact with treated or untreated wastewater as a result of treatment and disposal operations.

5. The discharger shall provide evidence that adequate land disposal areas will be made available and dedicated for this purpose.

6. Neither the treatment nor the discharge shall cause a nuisance.

7. The discharge shall not cause a pollution.

8. Disposal of accumulated sludge and other sewage solids or residue shall be in a manner approved by the Board.

B. Provisions

1. Order No. 73-16, "Waste Discharge Requirements for City of Hollister, San Benito County", adopted by the Board May 18, 1973 is hereby rescinded.

2. The discharger shall comply with the "Monitoring and Reporting Program" and "General Monitoring and Reporting Provisions" as specified by the Executive Officer.

3. The discharger shall submit the necessary plans and specifications in proper form and within the times required by the State Board, and shall commence and complete construction of the proposed project expeditiously, without undue delay, and in strict accordance with the regulations of the State Board and any State grant contracts.

4. Construction shall be completed by March 1, 1976.

5. The City of Hollister shall conduct a study of water supply quality and submit a report to the Board by March 1, 1975 outlining how it will comply with discharge specification number 3.

I, KENNETH R. JONES, Executive Officer, certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Coast Region on April 19, 1974.

_____
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

MONITORING AND REPORTING PROGRAM NO. 74-40
FOR
CITY OF HOLLISTER, SAN BENITO COUNTY

WATER SUPPLY MONITORING

Samples typical of the municipal water supply shall be collected and analyzed as follows:

Constituent	Units	Sampling Frequency
Total Dissolved Solids	mg/l	Twice per year
Sodium	"	" " "
Chloride	"	" " "
Sulfate	"	" " "
Total Nitrogen (as N)	"	" " "
Total Hardness	"	" " "
Boron	"	" " "

EFFLUENT MONITORING

All effluent samples shall be representative grab samples collected from the last pond in the disposal pond system. The following shall comprise the effluent monitoring program:

Constituent	Units	Sampling Frequency
Settleable Solids	ml/l	Daily
Suspended Solids	mg/l	Weekly
Specific Conductance	umhos/cm@25°C	Monthly
Total Dissolved Solids	mg/l	Twice per year
Sodium	"	Quarterly
Chloride	"	"
Sulfate	"	"
Total Nitrogen (N)	"	"
Total Hardness	"	"
Boron	"	"
Daily Flow	gallons	Daily

GROUND WATER MONITORING

Ground water samples shall be grab samples obtained from State Well Nos. 12S/5E-30J1, 12S/5E-30J5, and 12S/5E-30R1 or substitute wells approved by the Executive Officer. The samples shall be collected after each pump has run long enough to purge the well of standing water. The following shall constitute the ground water monitoring program:

Constituent	Units	Minimum Frequency of Sampling	
Total Dissolved Solids	mg/l	March and September	
Sodium	"	"	"
Chloride	"	"	"
Sulfate	"	"	"
Total Nitrogen (N)	"	"	"
Total Hardness	"	"	"
Boron	"	"	"

REPORTING

Quarterly monitoring reports shall be submitted to the Regional Board by the 15th day of the following quarter. In reporting the monitoring data, the discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized to demonstrate compliance with waste discharge requirements.

ORDERED BY _____
Executive Officer

April 19, 1974
Date

APPENDIX A
ORDER 74-40

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION
GENERAL MONITORING AND REPORTING PROVISIONS

******

GENERAL PROVISIONS FOR SAMPLING AND ANLYSIS

Unless otherwise noted, all sampling, sample preservation, and analyses shall be conducted in accordance with the current edition of "Standard Methods for the Examination of Water and Waste Water" or approved by the Executive Officer.

All analyses shall be performed in a laboratory certified to perform such analyses by the California State Department of Public Health or a laboratory approved by the Executive Officer.

All samples shall be representative of the waste discharge under the conditions of peak load.

GENERAL PROVISIONS FOR REPORTING

For every item where the requirements are not met, the discharger shall submit a statement of the actions undertaken or proposed which will bring the discharge into full compliance with requirements at the earliest time and submit a timetable for correction.

By January 30 of each year, the discharger shall submit an annual report to the regional board. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous year. In addition, the discharger shall discuss the compliance record and the corrective actions taken or planned which may be needed to bring the discharge into full compliance with the waste discharge requirements.

APPENDIX A
ORDER 74-40

The discharger shall file a written report within 90 days after the average dry-weather flow for any month that equals or exceeds 75% of the design capacity of the waste treatment or disposal facilities. The report shall contain a schedule for studies, design, and other steps needed to provide additional capacity or limit the flow below the design capacity prior to the time when the waste flow rate equals the capacity of the present units.

CITY OF HOLLISTER
SETTLEABLE SOLIDS DAILY TEST
(VOLUME METHOD ml/l)

1. Procedure:

   a. Fill the imhoff cone to the liter mark with a thoroughly mixed sample. Allow to settle for 45 minutes; gently stir the sides of the cone with a rod or by smoothly spinning the cone without causing turbulence within the liquid contents; continue to settle for 15 minutes longer and record the volume of settleable matter in the cone as ml/l.

   b. All samples are grab samples which will be taken from the downflow side of the wiers of the clarifier.

Date	Time	Location	Settleable Solids ml/l	Remarks

APPROVAL

I hereby certify that the attached General Plan Element for the City of Hollister, California was duly and regularly approved by Resolution No. 76-8 of the Planning Commission of the City of Hollister on the 27th day of May, 1976.

s/ Larry Nicholson
Chairman of the Planning Commission
of the City of Hollister

ATTEST:

s/ Thomas E. Barry
Secretary of the Planning Commission
of the City of Hollister

ADOPTION

I hereby certify that the attached General Plan Element for the City of Hollister, California was duly and regularly adopted by Resolution No. 76-64 of the City Council of the City of Hollister on the 26th day of October, 1976.

s/ Alfred Ledford
Mayor of the City of Hollister

ATTEST:

s/ Frank D. Felice
Clerk of the City of Hollister

NOISE ELEMENT

TABLE OF CONTENTS

Purpose. The increasing invasion of the environment by noise producing sources has as its cause, among other things, the population explosion and the technology to cope with it.

Everywhere noise machines are at work -- in the street where jackhammers are ripping up the pavement to bury television cable; in the field where diesel tractors are going about the tasks essential to the agricultural economy; on the highways busy with huge trucks which are the lifeblood of the transportation system; in the sky where sleek airliners are whisking passengers back and forth across the continent in half a day's time; and in the home where the vacuum cleaner, dishwasher, laundry machines, garbage disposal, television, the teenager's hifi and her brother's power scooter -- all combine to fill our daily lives with a loud cacophony of sound.

The increasing awareness of the effect of noise on our health and well being has prompted the California Legislature to require a Noise Element as a part of the General Planning process. Their mandate is found in Section 65302 of the Government Code of California.

Legal Basis. Section 65302 of the Government Code of California reads in part as follows:

> "65302. The General Plan shall consist of a statement of development policies and shall include diagram or diagrams and text setting forth objectives, principles, standards, and plan proposals. The plan shall include the following elements:... (g) A noise element in quantitative, numerical terms, showing contours of present and projected noise levels associated with all existing and proposed major transportation elements.

These include but are not limited to the following:

(1) Highways and freeways

(2) Ground rapid transit systems

(3) Ground facilities associated with all airports operating under a permit from the State Department of Aeronautics.

"These noise contours may be expressed in any standard acoustical scale which includes both the magnitude of noise and frequency of its occurrence. The recommended scale is sound level A, as measured with A-weighting network of a standard sound level meter, with corrections added for the time duration per event and the total number of events per 24-hour period.

"Noise contours shall be shown in minimum increments of five decibels and shall be continued down to 65 db(a). For regions involving hospitals, rest homes, long-term medical or mental care, or outdoor recreational areas, the contours shall be continued down to 45 db(a).

"Conclusions regarding appropriate site or route selection alternatives or noise impact upon compatible land uses shall be included in the general plan.

"The state, local, or private agency responsible for the construction or maintenance of such transportation facilities shall provide to the local agency producing the general plan, a statement of the present and projected noise levels of the facility, and any information which was used in the development of such levels."

(1)

Fundamentals of Sound. Noise is sound and sound is sometimes defined as that form of vibrational energy that gives rise to the sensation of hearing. While this definition is acceptable, it is of limited usefulness in understanding how sound is generated, propagated, and perceived.

The most common physical mechanism for generating sound is the mechanical vibration of solid surfaces. Such surfaces can be excited into vibration by numerous mechanisms, such as transient or periodic impacts or oscillatory motions of equipment.

Consider what happens when the sheetmetal panels of a truck hood are set into vibration due to engine operation within the enclosure. The vibrating panel moves alternately back and forth. As it moves forward, it pushes against the air nearest it. When the panel reverses its direction of motion, it produces a partial vacuum, or rarefaction, in the nearby air. The alternate compression and expansion of the air adjacent to the panels results in small local fluctuations in the atmospheric pressure. These fluctuations in turn cause a portion of the air farther away from the panel also to fluctuate in pressure.

This local disturbance is thus propagated through the air in the form of sound waves that reach our ears. In addition to being generated by the mechanical vibration of solid surfaces, audible sound is frequently generated by the flow of gases, e.g., by compressed air exhausting from a pneumatic hammer or by the turbulent jet exhaust of an aircraft.

---

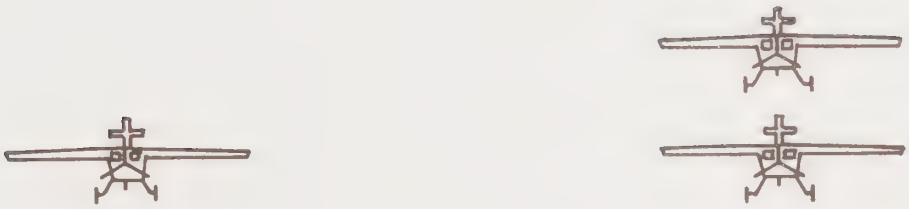
(1) Fundamentals of Noise: Measurement, Rating Schemes, and Standards; The National Bureau of Standards, Interagency Agreement with the U. S. Environmental Protection Agency, Office of Noise Abatement and Control, Washington, D.C., December 31, 1971.

Range of Sound. The range of sound pressures between the threshold of hearing (for normal young people the smallest sound pressure the human ear can sense) and the highest sound pressure to which people are exposed (the lift-off noise near a Saturn rocket) covers a range of 1,000,000,000 to 1. Since there is interest in observing the effects of small changes at both extremes, a linear scale would be impractical. A simple mathematical scale suited to this range of numbers is a scale based on the logarithm (to the base ten) of the relative sound pressures.

The range from 1 to 1,000,000,000 would be compressed to a scale running from 0 to 9 (the logarithm of 0 is 1, the logarithm of 1,000,000,000 is 9). This is a system based on the number of tenfold increases rather than on the actual number itself.

The Decibel. The numbers 0 to 9 represent relative quantities, and the quantity measured on such a scale is referred to as a level. Scientists and engineers usually work with energy quantities that would be proportional to the square of the sound pressure rather than to the sound pressure itself. This presents no difficulty, since the logarithm of a squared number is two times the logarithm of the original number; therefore, instead of a range of levels from 0 to 9, the range runs from 0 to 18 for sound pressure squared. The unit on this scale is called a bel. The bel has been divided into 10 smaller units known as decibels, so that the range of sound pressures, from approximate threshold of hearing to Saturn rocket noise, runs from 0 to 180 decibels.

The decibel scale is extremely useful; however, it can be puzzling since the mathematical operations differ from those to which we are accustomed through normal use of linear scales. On a linear scale, the total sound power generated by two identical noise sources would be twice the sound of one of the sources operating alone.



76 dB

79 dB

Doubling the number of identical sources results in a 3 dB increase in sound pressure level.

Figure 1

However, on a logarithmic scale the total sound pressure level resulting from two identical noise sources would be 3 dB higher (Figure 1) than the level produced by either source alone. (If you double a number, its logarithm will always go up by 0.3; 0.3 bels = 3 decibels).

Sound Frequency. In addition to responding to the magnitude of sound pressure, the human ear is sensitive to the frequency of the sound. The frequency region corresponding to the frequency range of the normal human ear -- 20 to 20,000 Hertz (1 Hertz (Hz) = 1 cycle per second) -- is referred to as the audio region. In reality, the human hearing range varies from person to person, depending on age, possible hearing loss, and physiological conditions. Other regions exist below and above the audio region. These are referred to as the infrasonic range (20 Hz and below) and the ultrasonic range (20,000 Hz and above). Explosions, rocket engines, and various natural phenomena generate sounds in the infrasonic range, while a portion of the noise generated by jet engine and rotary machinery and sounds used by porpoises and bats for guidance and communication are in the ultrasonic range.

Sound Measurement. A basic instrumentation system for measuring sound consists of:

1. A transducer

2. An electronic amplifier and calibrated attenuator for gain control

3. A readout device

The most commonly used instrument containing these components is the sound level meter. In addition to the basic components described above, the sound level meter also contains weighting networks that give greater importance to sounds in certain frequency ranges. A

typical sound level meter contains three different response weighting networks, designated as A, B, and C. A new weighting curve -- the D curve -- has been proposed for measuring jet aircraft noise.

The most commonly used sound level meter utilizes the A-weighting network. The A-weighted sound level is emerging as the measure most often utilized in objective and subjective studies of noise.

The Decibel Scale. In order to translate this somewhat technical information into a more understandable form Table 1 has been prepared which shows the relationship between the decibel scale and a sound which is typical of that intensity.

TABLE 1

THE DECIBEL SCALE

dBA	Nature of Sound
0	Threshold of Hearing
10	Normal Breathing
20	Leaves rustling in a breeze
30	Empty movie house - Electric refrigerator
40	Residential Neighborhood at night
50	Quiet Restaurant
60	Two-person conversation
70	Busy traffic
80	Vacuum cleaner - Electric dishwasher

TABLE 1

THE DECIBEL SCALE
(cont'd)

dBA	Nature of Sound
90	Water at foot of Niagara Falls
100	Subway train - garbage disposal
120	Propeller plane at take off
130	Machine gun fire, close range
140	Military jet at take off

Noise. What is noise? It is, quite simply, an unwanted sound. How do we rid ourselves of an unwanted sound? This is not a simple matter because individuals differ as to what sound they like and which they dislike. A symphony goer might find rock and roll music exceedingly distasteful and vice-versa.

Probably the kind of noise most irritating to the largest number of people is that which interferes with conversation. A passenger engrossed in reading a newspaper on a subway train is unconscious of the roar beating upon his eardrums. But two people who want to carry on a conversation would be highly conscious of the noise and irritated by it.

Someone has said that noise is a random pattern of sound which keeps the listener in a state of constant distraction and suspense -- waiting, as it were, for the other shoe to drop. Sounds that are completely meaningless to the listener may be irritating. Some technical dictionaries still define noise in these terms alone "a class of sounds which do not exhibit clearly defined frequency components." Taken collectively, the trills and toots of an orchestra tuning up illustrate this definition.

Each player is independently testing his own instrument; there is no overall relationship among the tones being played nor can any dominant pattern of frequency be distinguished.

A sound that does not have a stable and well defined pattern of frequency or rhythm, and persists for more than a short period of time, is disturbing to most people because of its apparent senselessness.[2]

Effect of Noise. An important physiological effect of excessive noise, and therefore the basis for an important noise criterion, is permanent hearing handicap. This might occur after a person has been exposed to loud sounds on a recurrent daily basis over a long period of time. Occupational deafness represents this type of problem, as noted in surveys of workers in heavy industry.

The measurement of hearing loss of a person is accomplished by measurement of the lowest (weakest) sound pressure level, called the threshold, that the individual can hear. This is done with an audiometer, which is an electroacoustical instrument consisting of an electronic oscillator, attenuator, and earphone for producing sound pressure levels in the ear of the subject at various frequencies. The amount, expressed in decibels, by which a person's measured threshold of audibility exceeds the standard (normal) audiometric threshold is his hearing threshold level.

---

(2) Adapted from Sound and Hearing, S. S. Stevens, Fred Warshofsky and the Editors of Life Magazine, Life Science Library, p 170 et seq.

Hearing measurements made with audiometers are thus expressed as hearing threshold levels (in dB) at various pure-tone frequencies (in Hz). A person is recognized as having a slight hearing impairment for speech sounds whenever the average of his hearing threshold levels at 500, 1000 and 2000 Hz lies between 25 and 40 dB.

Noise Control. Current guidelines for occupational noise exposure control are primarily aimed at protecting hearing in a restricted range of frequencies, typically 500 to 2,000 Hz, which is critical to the understanding of speech. On this basis hearing handicap is defined as: the condition wherein the average hearing threshold levels at 500, 1000 and 2000 Hz exceed 25 dB. These guidelines, with which present Federal regulations are consistent, are intended to protect 80 to 90 percent of the exposured worker populace from noise-induced hearing handicap, as defined above. Empirical data have been used as the basis for establishing guidelines for group exposure to continuous noise. The recommendations for limits on intermittent, or interrupted, exposure are based mainly on studies of temporary threshold shift resulting from various types of noise exposure.

TABLE 2

Maximum Recommended Occupational Noise Exposure

The values in parentheses are not explicitly given in the guidelines (1) being discussed but are consistent therewith and are given explicitly in present Federal regulations (2).

Sound Level dBA	Daily Exposure Time hr
90	8
(92)	(6)
95	4
(97)	(3)
100	2
(102)	(1-1/2)
105	1
110	1/2
115	1/4 or less

This table is based upon: (1) data which indicate that an 8 hour per day continuous exposure to levels below 90 dBA, over a period of many years, will not produce a noise-induced hearing handicap, as defined above, in 80 to 90 percent of the exposed population, and (2) data, mainly from studies based on temporary threshold shifts, which indicate that for each halving of the time of noise exposure per day the noise level may be increased by 5 dB without increasing the hazard of hearing impairment.

These guidelines specify that when the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each.

The permissible limits (guidelines) given in Table 2 are primarily concerned with occupational noise exposure. Such limits are typically keyed to a maximal eight-hour exposure day and, further, assume quiet conditions to exist outside of the usual eight-hour work period to permit auditory recovery. Occupational noise exposure limits are primarily aimed at protecting most, but not all, of the worker population from suffering a hearing impairment resulting in a handicap for understanding speech. The protection provided by such limits may be viewed as acceptable in an industrial setting since the worker can be financially compensated for any hearing damage incurred. However, in off-job situations it would appear justifiable to strive to protect all persons from any measurable loss of hearing due to noise exposure. This would include protection of hearing at higher frequencies which are very important, for example, to the appreciation of music.

A recent paper (3) by Cohen, Anticaglia, and Jones of the National Noise Study, U. S. Department of Health, Education, and Welfare, suggests the noise limits given in Table 3 for nonoccupational noise exposure. These were set 15 decibels below the occupational limits (Table 2)

---

(3) Cohen, A., Anticaglia, J., and Jones, H.H., "Sociocusis"--hearing loss from nonoccupational noise exposure, Sound and Vibration 4 (11), 12-20 (November 1970).

in order to provide protection of essentially all persons at all audiometric frequencies. These suggested limits appear reasonable but there is a need for supportive data regarding both continuous and intermittent noise.

TABLE 3

Maximum Suggested Nonoccupational Exposure

Sound Level dBA	Daily Exposure Time
70	16-24 hour
75	8
80	4
85	2
90	1
95	30 minutes
100	15
105	8
110	4
115	2

Minor Noise Sources. Existing agricultural enterprises surrounding population centers in the Hollister planning area such as poultry farms, feed lots, and dairies at times may emanate minor noises. These conflicts can probably be avoided by proper zoning procedures.

There are some minor noise sources such as those related to agriculture that are often more annoying than they are injurious to the human ear. Examples are wind machines used for frost protection and summer cooling, air carrier sprayers, airplanes used for crop dusting, tractors, earth moving equipment, and pumps.

Other minor noise sources are those which come from playgrounds, particularly at schools, the intermittent and usually short lived sounds of construction work, sirens on emergency vehicles, and an occasional radio or TV set turned up too high. There are, of course, a number of other minor sound generators but the foregoing are typical examples.

Major Noise Sources. The Legislature has specifically listed three noise sources for which "present and projected noise levels" must be included in the General Plan. These are "highways and freeways, ground rapid transit systems, and ground facilities associated with all airports operating under a permit from the State Department of Aeronautics." The second of these items is not applicable to the Hollister planning area.

Highways and Freeways. The major transportation network in the Hollister planning area consists of state highways, county roads and city streets. From a traffic volume standpoint the road and street system represents only a minor percentage. Traffic noise generated on it is small and highly intermittent. It appears at this point in time that, with a few exceptions, any possibility either now or in the foreseeable future of the noise level on the street system exceeding acceptable standards is remote.

State Highways. In November 1972 the Environmental Studies Section of the Materials Department, District 5, California Division of Highways, issued an official publication "Noise Levels for State Highways in San Benito County." The publication covers all of the present and future state highways planned for the county. The report consists of some brief text and the graphic material illustrative of it. The report, in part, is as follows:

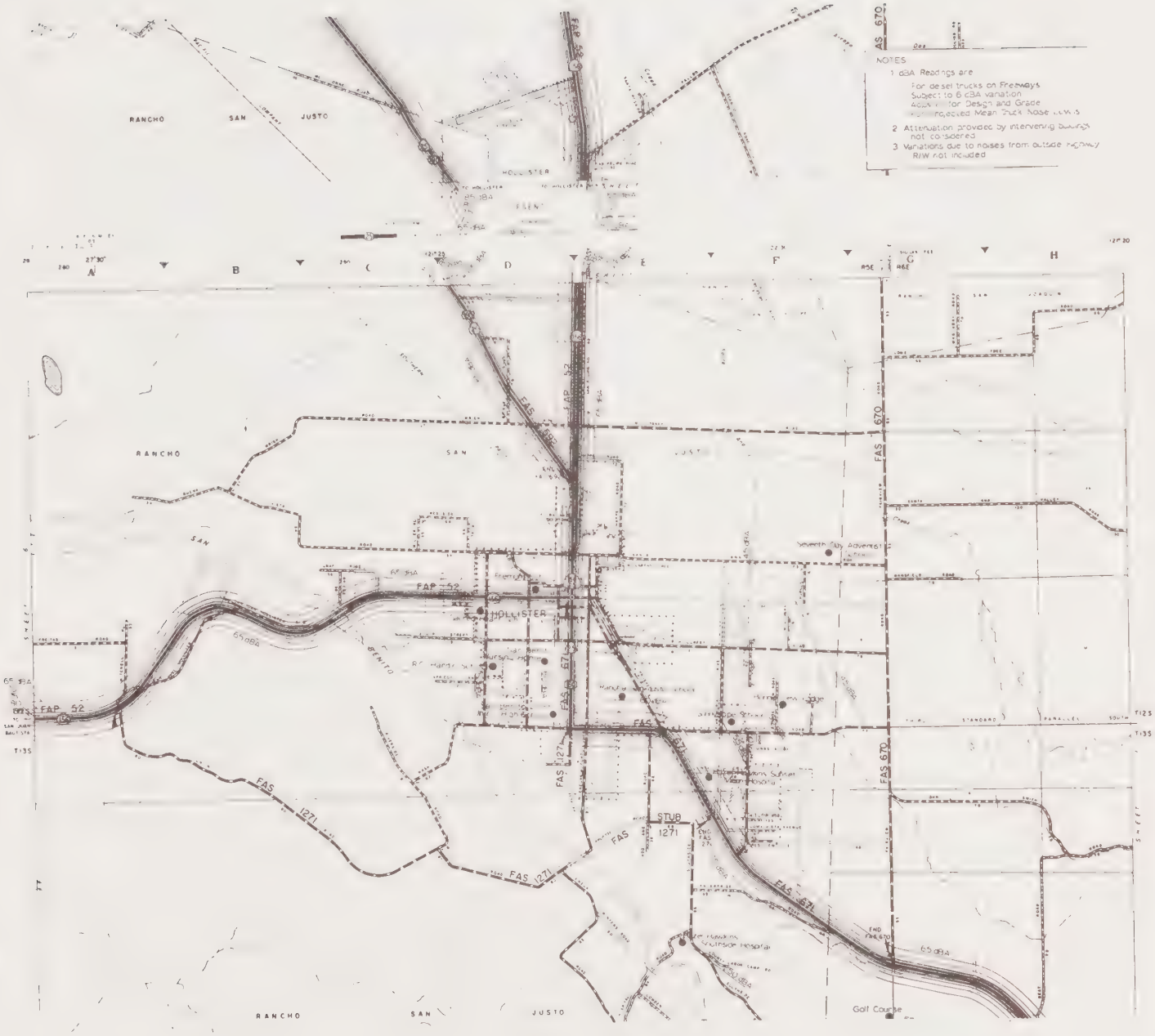

NOTES
1. dBA Readings are
For diesel trucks on Freeways
Subject to 6 dBA variation
Adjustment for Design and Grade
Not Projected Mean Truck Noise Levels
2. Attenuation provided by intervening buildings not considered
3. Variations due to noises from outside Highway R/W not included
RANCHO
SAN
JUSTO
HOLLISTER
FAP 52
FAS 670
FAS 1271
STUB 1271
65 dBA
Golf Course

Figure 2

"This report covers the noise levels for all state highways in San Benito County for present and future conditions, as requested by Mr. Keith A. Carlen, Road Commissioner, San Benito County under Section 65302 of the Government Code:

"In showing the noise contours....it is assumed that all state highways will have diesel truck traffic.....

"Due to low traffic volumes and lower traffic speeds in this county noise levels shown are generally higher than existing conditions, however, these levels can be expected occasionally at all locations.

"These levels can be used as expected maximums for the present and the future. Also shown are presently adopted routes with contours shown for expected maximums in the future.

"These contours do not make any allowance for variations due to cut or embankment sections, buildings, barriers or other structures outside of the highway right-of-way.

"No variations are included due to local traffic noises or other noises generated by sources outside the state highway right-of-way."

Included in the report are noise contours for State Highway routes in the Hollister Planning Area (Figure 2 facing page).

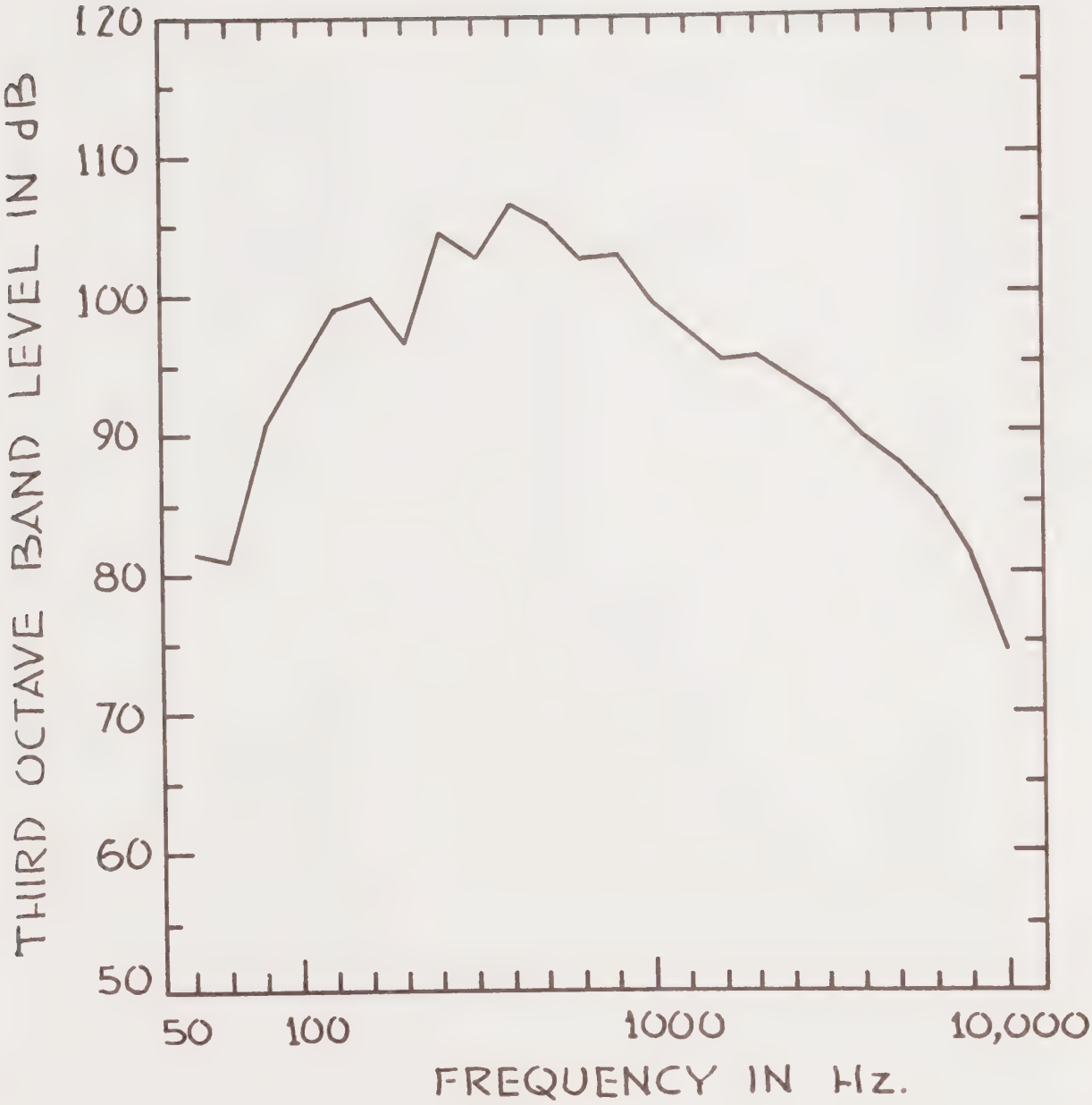
Airport Noise. Airports give rise to two kinds of noise. One type is that which comes from ground installations which can be readily measured by conventional methods.

The other type is generated by the aircraft operating from the airport. The measurement of this type of noise makes use of an entirely different method and is quite complex. The techniques use as a "basic building block" the noises produced by individual airplanes. These data are then combined to take into account the number and nature of the aircraft operations for the particular airport under consideration.

There are two U. S. measures, the Composite Noise Rating (CNR) and the more recent Noise Exposure Forecast (NEF). These give a much heavier weighting to operations at night than those during the day -- reflecting the higher degree of annoyance caused by night flights.

The NEF contour calculation procedure is quite complex. It uses a factor called "Effective Perceived Noise Level" (EPNL). This is defined as a physical measure designed to estimate the effective "noisiness" of a single noise event, usually an aircraft flyover; it is derived from instantaneous perceived noise level (PNL) values by applying corrections for pure tones and for the duration of the noise.

In addition to the EPNL data for each type of aircraft, other factors that are included are the mix of aircraft, number of operations, runway utilization, flight path, operating procedures, and time of day.



One-third octave band levels for an executive jet aircraft at an altitude of 500 feet during an approach operation.

Figure 3

The NEF measure has been criticized because it omits certain other factors which are thought to be important. Among these are the local weather, wind, and especially, temperature inversions which can drastically change the noise exposure at some locations. Steps have been taken by the Federal Aviation Administration to amend its regulations to require altitude and temperature accountability in noise certification tests. Another factor which may be added to the computation is a determination of noise contours for the specific airport location.

Jet Aircraft. Jet propulsion is no longer used exclusively by commercial airliners. Corporations and individuals with widespread interests are increasingly making use of what are sometimes referred to as "executive jets." To have as wide a market as possible this equipment must be designed to land and take off on the smaller airports which are remote from those of the large cities.

Thus, any community with a reasonable sized airport has an interest in the nature of the noise which such aircraft develop. The chart on the facing page (Figure 3) is a record of what occurs when an executive jet is at an altitude of 500 feet during an approach to the airport runway.

The frequency of the sound emitted by the aircraft engines is plotted along the base line of the graph and the sound level along the vertical side line. It can be seen that the highest volume of sound, 106 dBA, has a frequency of 700 Hz. For comparison the musical note "A" above middle C (the standard to which American instruments are tuned) is 448 Hz. Middle C itself is 261.6 Hz.

Noise Exposure Contours for 1976

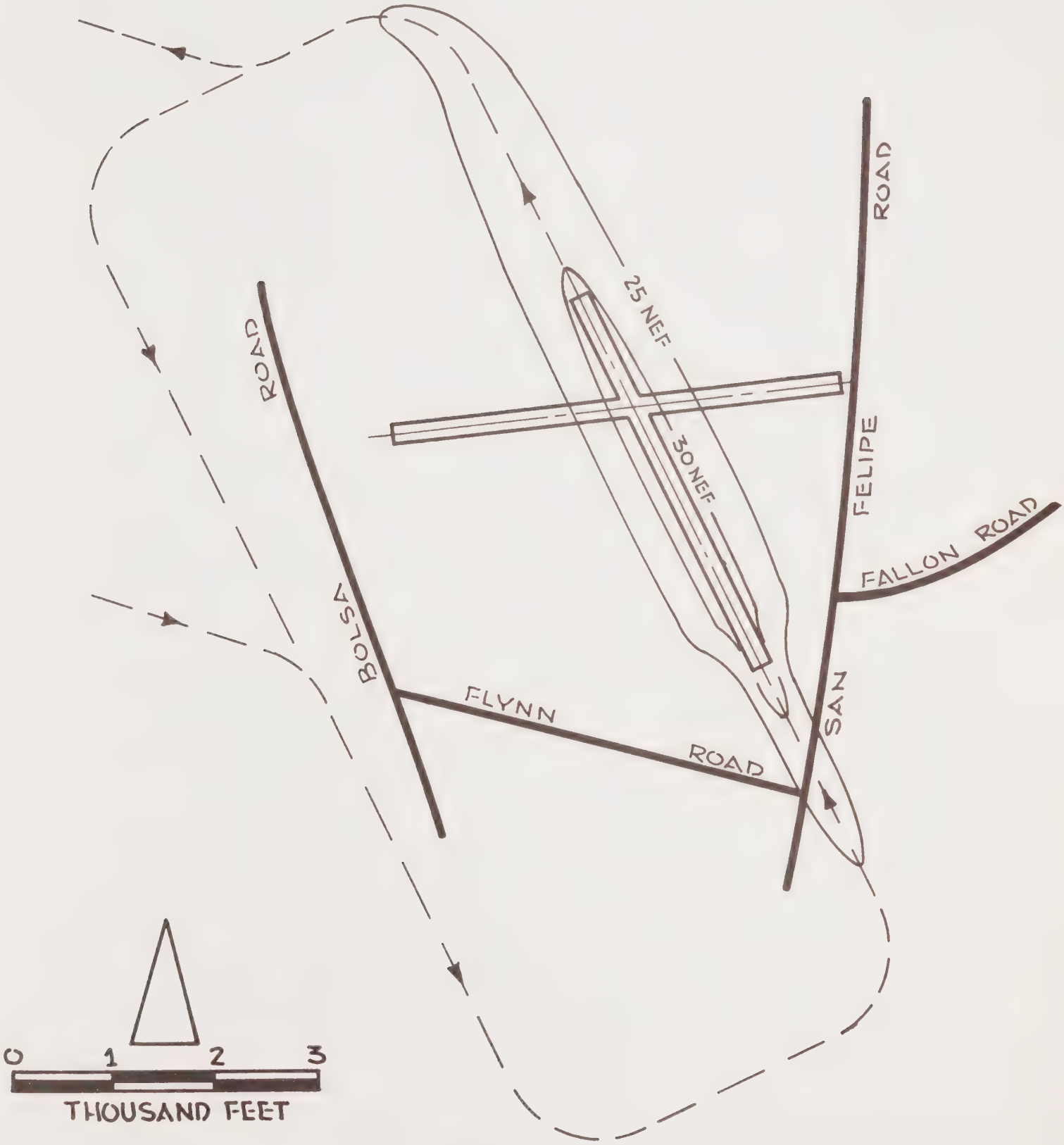


Figure 4

Hollister Airport. The Hollister Airport is located about two and one-half miles north of the city. It has an east-west 4,350 foot runway and a north-south runway of 4,020 feet. During 1970 there were approximately 60,000 takeoffs and landings, of which one-third were associated with the pilot training process. The takeoff and landing count for 1975, including training flights, was 75,000.

Specific noise contours for the Hollister Airport are not currently available. The City Council has retained three consultants who, during the next fiscal year, will make studies and prepare a Master Plan for the future development of the airport. As a part of these studies noise contours will be developed and it will then be possible to amend this element to contain this information.

The Federal Aviation Administration has issued noise exposure forecast contours for airports having 100,000 and 200,000 operations a year. Since the Hollister Airport is approaching this number of flight operations the FAA figures give a good approximation of the 100,000 situation so these contours have been plotted and are shown on the facing page (Figure 4).

Assuming that the present rate of growth will continue, a conservative estimate indicates that the 200,000 operational mark will be reached by 1990, if not before. The noise exposure forecast contours, as calculated by the FAA, are shown on the chart facing page 18 (Figure 5).

Noise exposure forecast contours for 1990

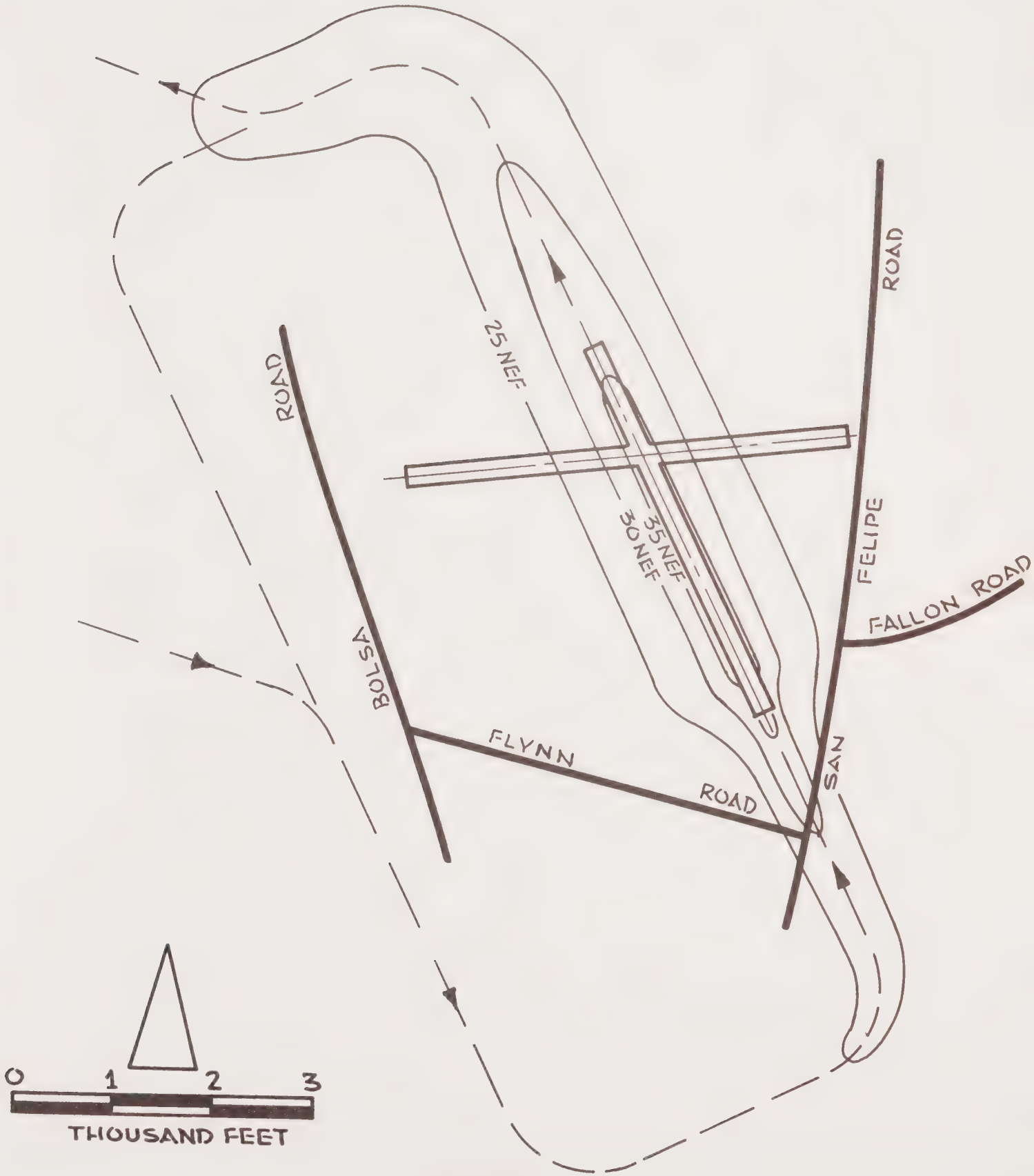


Figure 5

The buildings and facilities normally used at the Hollister Airport are in excess of 500 feet from the nearest boundary line of the property which is along San Felipe Road. There are no hospitals, rest homes, long-term medical or mental care institutions, or outdoor recreation areas which are affected by the Hollister Airport operations. The noise level at the closest airport boundary from ground facilities is below 65 dB, and, in fact, is well below the ambient noise level created by the highway traffic on San Felipe Road, a state highway.

Accordingly, no noise contours have been plotted since they are below the standard set forth in Section 65302 of the Government Code.

Conclusion. Hollister Airport should be protected for future needed expansion by proper zoning to eliminate the possibility of encroaching residential and incompatible uses such as schools.

Noise is becoming an increasingly adverse environmental factor. In adopting zoning regulations to implement the General Plan, performance standards limiting the volume and duration of off-premise noise should be established. The time of day should be a consideration in the regulation of noise.

APPROVAL

I hereby certify that the attached General Plan Element for the City of Hollister, California was duly and regularly approved by Resolution No. 76-10 of the Planning Commission of the City of Hollister on the 22nd day of July, 1976.

s/ Larry Nicholson
Chairman of the Planning Commission
of the City of Hollister

ATTEST:

s/ Thomas E. Barry
Secretary of the Planning Commission
of the City of Hollister

ADOPTION

I hereby certify that the attached General Plan Element for the City of Hollister, California was duly and regularly adopted by Resolution No. 76-64 of the City Council of the City of Hollister on the 26th day of October, 1976.

s/ Alfred Ledford
Mayor of the City of Hollister

ATTEST:

s/ Frank D. Felice
Clerk of the City of Hollister

SEISMIC SAFETY ELEMENT

TABLE OF CONTENTS

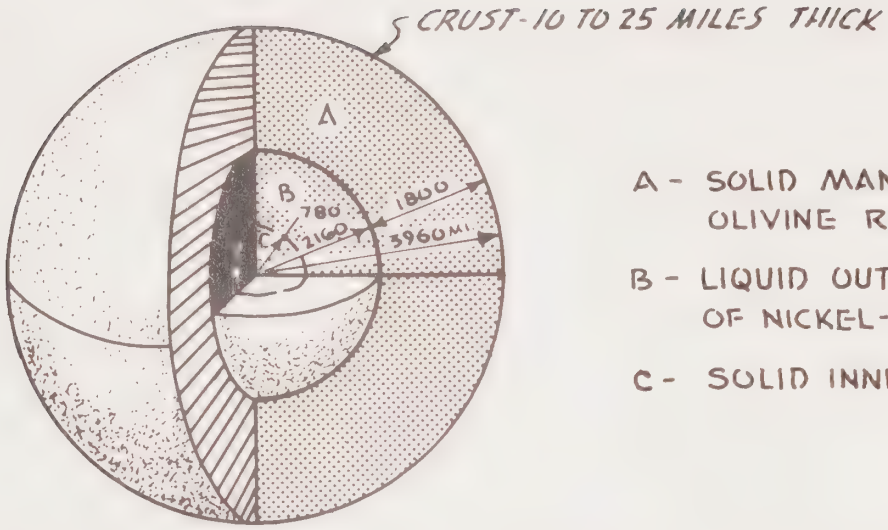
Foreword. Among the mandatory elements which must be adopted as a part of the Hollister City General Plan is a Seismic Safety Element. Historically Hollister and San Benito County have suffered from earthquakes of varying severity. The California Division of Mines and Geology, University of California, the U. S. Geological Survey, and the National Oceanic and Atmospheric Administration have conducted and continue to study the problem of earthquakes in the county.

Hollister is traversed by two major earthquake faults. In this respect it is similar to the City of Hayward which has a fault zone running through its central business district and its civic center. As a result of this the Hayward Planning Department assembled a staff of experts on the subject and after a year and a half study they issued an exhaustive report.(1) The report consists of two parts - background material and material specifically related to Hayward. This background material is written with such clarity that any layman, though unfamiliar with geologic terms, can understand it. The Planning Director of the City of Hayward has given permission to reproduce the portions of it which follow.

---

(1) City of Hayward, California Planning Department, Hayward Earthquake Study, April, 1972

FIGURE 1



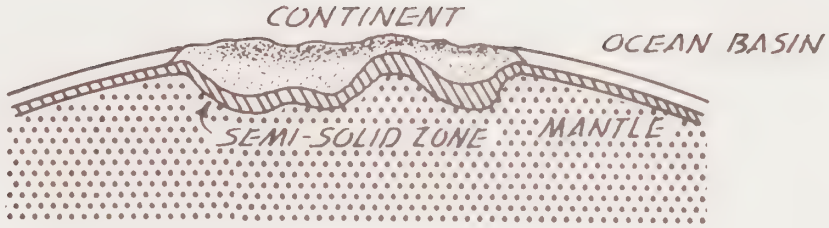
A - SOLID MANTLE OF OLIVINE ROCK.

B - LIQUID OUTER CORE OF NICKEL-IRON

C - SOLID INNER CORE

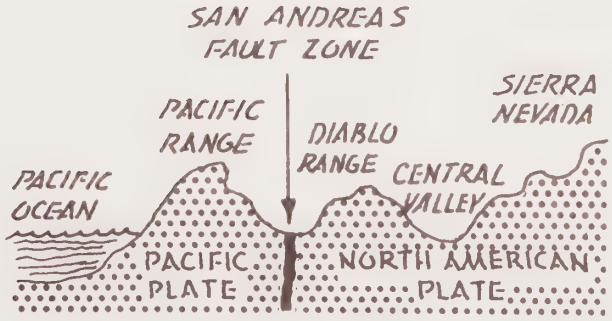
CONCENTRIC ZONES MAKE UP THE EARTH'S INTERIOR

FIGURE 2



CROSS SECTION OF INTERFACE BETWEEN EARTH'S CRUST AND MANTLE

FIGURE 3



A SIMPLIFIED CROSS SECTION OF SAN ANDREAS FAULT ZONE TO EMPHASIZE LOCATION OF BOUNDARY BETWEEN CRUSTAL PLATES

SEISMIC GEOLOGY

Overview. In order to understand seismic geology, it is important that the reader be familiar with the earth, its building processes, and the vocabulary used to describe them.

The earth is an almost spherical body approximately 3,960 miles in equatorial radius. The center is occupied by the core, a spherical zone, 2,160 miles in radius. The core is believed to be mostly liquid surrounding a central solid portion. Outside the core lies the mantle, a layer about 1,800 miles thick, composed of mineral matter in a solid state. The outermost and thinnest of the earth's zones is the crust, a layer some 3 to 40 miles thick. (See Figure 1, facing page)

The continents, oceans, and ocean basins compose the major portion of the earth's crust. However, the crust is not one continuous solid mass. It is composed of a number of plates which rest on the mantle and are subject to movement. A semi-solid zone at the interface of the earth's crust and the mantle allows for movement of the crustal plates. It is the movement of these plates into each other, away from each other, over each other, or beside each other, which causes earthquakes. (See Figure 2, facing page)

The boundary lines between the earth's crustal plates are not always readily distinguishable on the earth's surface. Most people, when they think of surface boundaries, visualize political boundaries between nations and states or the more easily perceived physical boundaries on the earth's surface between oceans and continents. But a crustal plate may contain a number of nations, or contain oceans and continents, or a portion of both. A good example of the latter is the San Andreas fault system which passes through the California coastal region.

The plates on either side of the San Andreas Fault Zone are composed of the following: the Pacific Plate consists of portions of the Pacific Ocean and sections of coastal California, including portions of the coastal mountain range; the North American Plate is composed of a portion of the North American continent east of the fault zone. (See Figure 3, facing page 2) The fault which separates these two plates is not always perceivable on the earth's surface, but there are land forms, and geologic criteria and instrumentation which can be used to map its location. The fault is not one solid, continuous line, but is composed of a system of splinter faults which appear periodically on the earth's surface. The term fault trace is used to describe a line on the surface of the earth formed by the intersection of the fault with the earth's surface.

Ground rupture and cracking are surface expressions of earthquakes which originate on subsurface faults. Earthquakes occur at various depths within the earth's crust. The point below the surface where the rupture first occurs is known as the focus and can be located with the help of seismic instruments. The news media usually use the term "epicenter" to describe the point of initial rupture. Used in this context, the term is a misnomer. The epicenter of an earthquake is measured in two ways. The instrumental epicenter is that point on the earth's surface directly above the focus but may not be the area of maximum damage. The field epicenter is defined as the point of strongest ground shaking. The field epicenter may coincide with the instrumental epicenter.

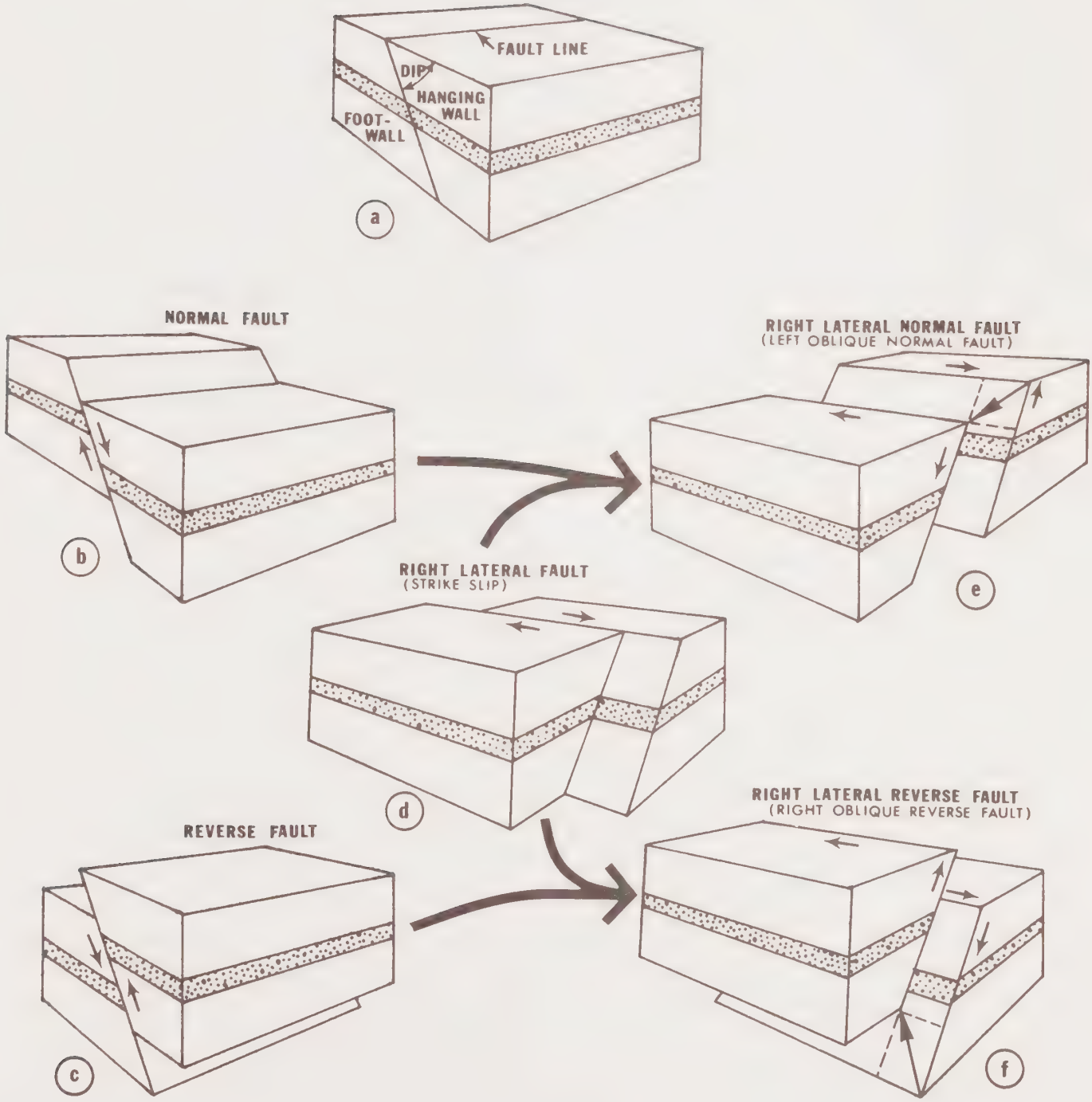


Figure 4
Diagram Courtesy
Hayward Planning Commission

The mechanics of these tectonic movements involve a very slow stress-building movement within the earth's crust, normally along an existing earthquake fault. The stress in the crust is a result of crustal block movement. The resultant tectonic movement is a product of the stress release between the two opposing plates. At the present time, it is believed that there are two kinds of faults: (1) active faults which have experienced displacement in recent geologic time, suggesting that future displacement can be expected on these faults; and (2) inactive faults that have shown no evidence of movement in recent geologic time, suggesting that these faults are dormant. However, some faults labeled as inactive are so termed due to lack of experimentation and research. Increased research and monitoring of these faults may expose them as active.

All fault movements are not the same. From the blocks in Figure 4, facing page, we get a visual representation of the various types of faulting which can occur along an earthquake fault. In Diagram (a) we see a symbolic expression of a section of land prior to faulting. Diagram (b) illustrates vertical faulting in the normal manner. Diagram (c) is vertical faulting but this time in reverse, usually termed a fault thrust, where the hanging wall has moved up relative to the foot wall. Diagram (d) is a lateral fault, sometimes called a slip fault, where the rocks on either side of the fault have moved sideways in relation to each other. Diagram (e) is an example of right lateral in combination with normal faulting. Diagram (f) is a right lateral reverse fault. Movement is right lateral when the rocks on the opposite side of a fault move to the right, as observed while facing the fault; left lateral is when movement is to the left.

Earthquakes are not all the same. They can range from a minor disturbance to a catastrophic event. How then can we tell the difference between quakes and compare them to each other? The first attempt to classify earthquakes involved a description of their intensity. The scale used to measure the intensity of a quake is the Modified Mercalli Scale with intensities ranging from I to XII. (Refer to Appendix A for Modified Mercalli Scale with written descriptions of observations.) Intensity is a description of the physical effects of earthquakes. The lowest intensity ratings are based on human reactions, such as "felt indoors by few". The highest intensities are measured by geologic effects, such as "broad fissures in wet ground, numerous and extensive landslides, and major surface faulting." The middle intensity range is based largely on the degree of damage to buildings and other man-made structures. Intensity ratings are based on visual observation and are not measured with instruments.

The degree of intensity varies from place to place during an earthquake. Specific locations in an area may have an intensity rating of VIII because of soil conditions and type of building structure, while other locations affected by the same earthquake may only have an intensity of IV. Therefore, a single earthquake can have different intensity ratings based on geologic conditions, structural design, or distance from field epicenter.

In 1932, Charles Richter developed a system of tables and charts to deduce from seismological instruments a method of measuring the magnitude of an earthquake. The <u>magnitude</u> assigns a number to the calculated energy release of the earthquake. Because numbers are assigned to the calculated energy release, this system can rank earthquakes and compare them one to another. By this method, an earthquake is rated independently of the place of observation.

The magnitude is the logarithm (base 10) of the maximum amplitude of a seismogram referred to a distance of 63 miles from the epicenter. Under this sytem, an increase of one degree in magnitude is equal to 32 times the previous energy release. Thus an earthquake of magnitude 7 represents about 32 times as much energy release as one of magnitude 6; magnitude 8 represents 32 times the energy of magnitude 7 and, therefore, about 1000 times the energy of magnitude 6.

The following chart shows how the energy release increases logarithmically with the corresponding increase in magnitude.

TABLE 1

ENERGIES OF EARTHQUAKES (MAGNITUDE 1.0-9.0)

Earthquake Magnitude	Approximate Earthquake Energy
1.0	6 ounces T.N.T.
1.5	2 pounds T.N.T.
2.0	13 pounds T.N.T.
2.5	63 pounds T.N.T.
3.0	397 pounds T.N.T.
3.5	1,990 pounds T.N.T.
4.0	6 tons T.N.T.
4.5	32 tons T.N.T.
5.0	199 tons T.N.T.
5.5	1,000 tons T.N.T.
6.0	6,270 tons T.N.T.
6.5	31,550 tons T.N.T.
7.0	199,000 tons T.N.T.
7.5	1,000,000 tons T.N.T.
8.0	6,270,000 tons T.N.T.
8.5	31,550,000 tons T.N.T.
9.0	199,000,000 tons T.N.T.

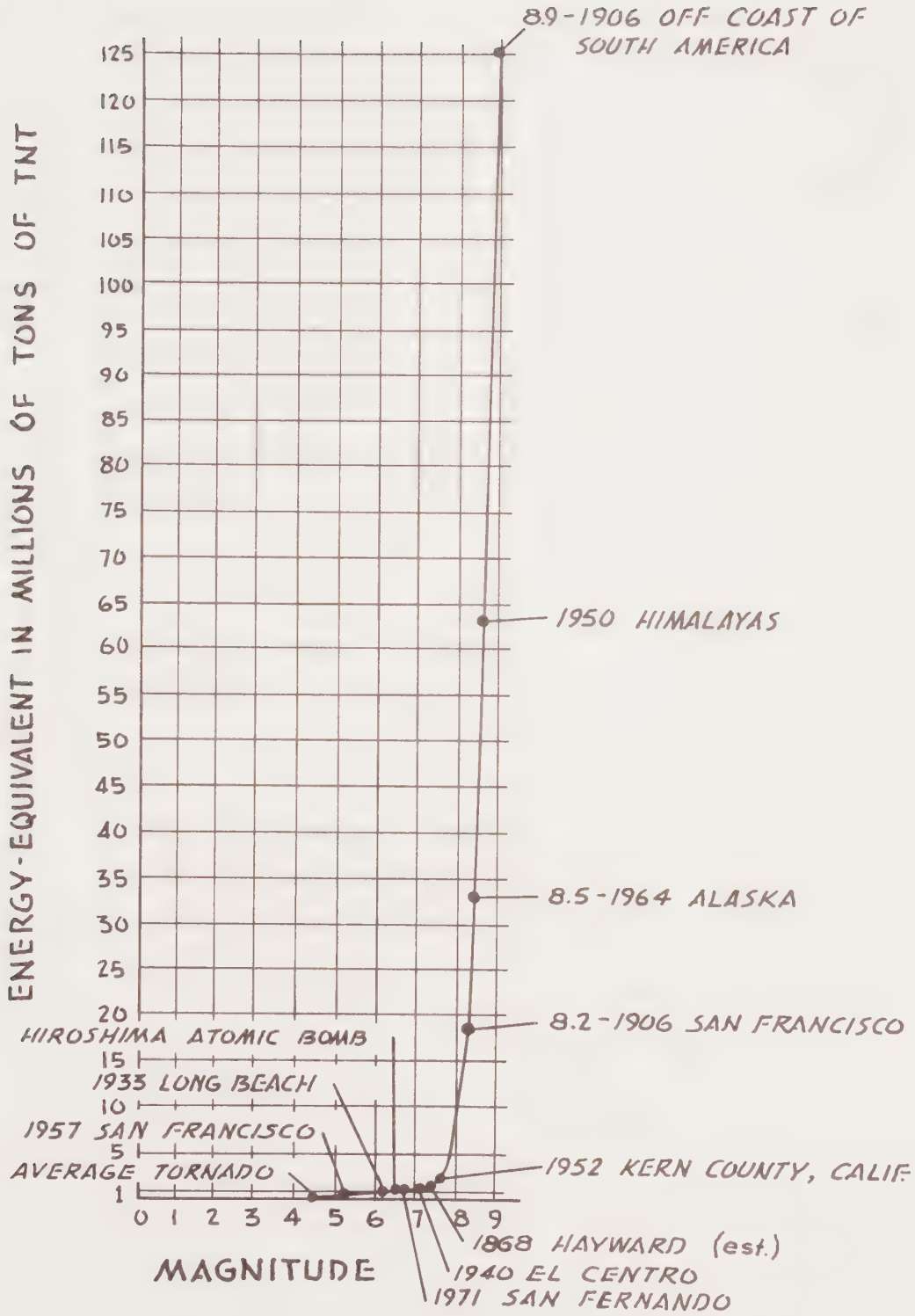

8.9-1906 OFF COAST OF SOUTH AMERICA
1950 HIMALAYAS
8.5-1964 ALASKA
8.2-1906 SAN FRANCISCO
1952 KERN COUNTY, CALIF.
1868 HAYWARD (est.)
1940 EL CENTRO
1971 SAN FERNANDO
HIROSHIMA ATOMIC BOMB
1933 LONG BEACH
1957 SAN FRANCISCO
AVERAGE TORNADO
ENERGY-EQUIVALENT IN MILLIONS OF TONS OF TNT
125
120
115
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
1
0 1 2 3 4 5 6 7 8 9
MAGNITUDE

FIGURE 5

The common belief is that a 9.0 quake is only four times as great as a 5.0 quake. However, as shown on the chart, an energy release of a 9.0 magnitude is one million times stronger than a 5.0 quake.

The graph (Figure 5 facing page) emphasizes the tremendous increase in energy release as the magnitude is increased to the point of a great earthquake (7.0) and higher. The most vigorous earthquakes recorded by seismographs were the 1906 quake off the coast of South America and the 1933 earthquake off the coast of Japan, both of which had magnitude readings of 8.9. Neither quake was a catastrophe as they struck where there were no cities to be leveled or people to be injured.

Seismic Expression and Its Significance for Urban Areas

The stress release of an earthquake is expressed in a number of ways on the earth's crustal surface. The most common expression of earthquakes is ground shaking. Ground shaking is a result of surface wave movement through the rock materials of the outer earth's crust. The ground motion created by these seismic waves is not constant. Its direction and velocity are directly related to the geological configuration of the earth's crustal material. Also, surface topography can cause compounding of ground waves which result in concentrations of energy.

As ground waves pass from rock to less dense material (alluvial or water-saturated rocks), they reduce velocity and generally increase amplitude. The more compacted material tends to filter out high frequency motion. The result is accentuated shaking on the surface for a longer period of time and at a longer period of vibration.

Therefore, proximity to the fault and/or area of initial subsurface rupture does not necessarily determine the intensity and duration of ground shaking that a building should be constructed to withstand. The type, configuration, depth, and density of the underlying soil and rock upon which a building is constructed will determine the maximum vibrational forces the overriding structure should be built to withstand.

For example, two buildings constructed beside each other on different configurations of soil and rock will be subjected to different magnitudes of vibrational forces even though they are equidistant from the epicenter of the earthquake. Extreme examples of the different reaction to ground waves by subsurface rock strata were noted after earthquakes in Venezuela and Mexico.

In Caracas, Venezuela, a high-rise building which was constructed adjacent to a masonry, colonial type structure reacted differently to ground shaking. The modern high-rise structure collapsed while the other remained standing. Likewise, an earthquake originating off the western coast of Mexico in the Pacific Ocean did less damage to cities located between the coast and Mexico City. However, in Mexico City there was extensive damage from the offshore earthquake. Therefore, the degree of ground shaking is not entirely related to proximity of the fault or epicenter but is also dependent on the composition of underlying geologic strata.

Numerous locations within a city will be subjected to various degrees of ground shaking. The strongest intensity ratings and greatest amount of structural damage should be expected in those areas where geologic conditions prolong and accelerate the amplitude of seismic waves. Because of the nature of wave movement, a structure built next to a fault on solid ground might withstand ground shaking better than a building built on loosely compacted, water-saturated material 200 miles or more away. Therefore, structures located a good distance from the fault can be a greater hazard than those located within the fault zone.

Damage from earthquake ground motion (shaking) is caused by the transmission of earthquake vibrations from the ground into the building structures. The resultant damage is related to the structural design, type of construction, and the intensity, period, and duration of ground motion. Buildings should be constructed to undergo severe shaking with minimal structural damage from vibrational forces and without collapsing. Buildings should also have systems (lighting, stairwells, communication, etc.) designed to remain functional under seismic conditions. The end result might be some structural damage, but not loss of life.

As earthquakes increase in magnitude (Richter Scale 1-10), there is a strong possibility of ground rupture. Ruptures usually occur on existing faults or fault traces, but rupture is possible anywhere within the entire region. The rupture begins at the focus and may extend to the earth's surface. As mentioned, the point of penetration at the surface is unpredictable, although there is a very strong probability it will occur in an area of previous ground rupture or cracking.

Just as it is impossible to predict the location of ground rupture all of the time, it is also impossible to predict if faulting will be horizontal, vertical, or oblique. However, it is possible to predict that any structure located at the point of surface rupture or faulting will experience immediate destruction of its foundation, with a probability of collapse or major damage.

Two other geologic processes which can result from an earthquake are landslides and liquefaction or nonsupport by soil acting as if it were a liquid. Seismically induced landslides can be catastrophic, particularly if the quake occurs during or following a period of heavy rainfall. The potential for landslides exists in an area of ancestral landslides and/or areas of unstable slopes. This is especially true where the slopes have been materially modified from their natural state. The possibility of landslides can be man-induced as a result of improper grading.

Liquefaction is generally associated with intense and prolonged ground shaking. The phenomenon occurs in loose or medium-dense, water-saturated, cohesionless materials which tend to subside and flow when subjected to earthquake vibrations. As the material tends to compact, the water pressure in the soil increases and it may reach the point where it becomes equal to the overburden pressure. At this point the soil loses its strength and liquefies. In addition, there may be a transfer of water from the lower to upper levels, involving a quick or liquid condition near the ground surface.

Buildings located over this type of soil will sink and/or tilt. And lighter materials, such as water and gas lines, will rise to the surface.

Another common seismic expression which occurs along a fault is tectonic creep. Creep is a slight, continuous movement along a fault and is usually not accompanied by felt eqrthquakes. Movement is usually in the range of fractions of an inch a year. Displacement is usually lateral and may eventually destroy the foundation and bearing walls of structures built directly over the fault. This process, over a period of years, may be sufficient to cause extensive damage to structures located astride the fault.

Earthquake Prediction. Earthquake prediction is still in its very crude stages, and there are probably as many theories about the possible location, magnitude, and time of the next quake as there are men studying them. However, we can be sure of one thing; earthquakes will continue to occur.

Although it is impossible to make precise earthquake predictions, it is possible to make some general earthquake projections. Earthquake prediction has three parameters. They are location, magnitude, and time.

Major Historic Earthquakes and Findings. Earthquakes are common to the west coast of the United States. In fact, in California alone there have been seven earthquakes recorded with a magnitude of 7.0 or higher since 1857. The highest earthquake ever recorded in the State was the 1906 San Francisco earthquake with an estimated magnitude of 8.3. Accounts of the effects of the earthquake on San Francisco have been rather sketchy and most of the damage has been attributed to the fire which followed the quake.

What then can be expected in an earthquake with a magnitude of 8.0 or higher? On March 27, 1964, the City of Anchorage, Alaska experienced an earthquake with a recorded magnitude of 8.4 on the Richter Scale. This earthquake was the first recorded quake to have affected water levels in wells, aquifers, and rivers all over the world. Fluctuation in water levels was recorded in 700 wells in Africa, Asia, Australia, Europe, and North America. The quake triggered some 51 avalanches, the largest involving 1300 cubic yards of rock. The land level was altered in an area of about 70,000 square miles in south-central Alaska. Between 23,000 and 35,000 square miles were displaced as much as 33 feet. The subsea extent of land movement is not precisely known, but elevation changes as much as 49 feet have been measured. The quake claimed 125 lives (one in a thousand) and 300 million dollars in initial damages. It should be noted the San Francisco earthquake of 1906 claimed 700 to 800 lives.

The Long Beach earthquake which occurred on March 10, 1933 at 7:54 in the evening is of special significance because it brought sharply to the attention of the general public the need for better standards in the construction of buildings. It was widely studied by experts on structural design, with the result that the Uniform Building Code was revised to take earthquake stresses into account. Recent studies made after the

San Fernando earthquake, February 9, 1971, have raised doubts in the minds of many experts as to whether Building Code regulations based on the Long Beach experience are now valid. This is discussed under the heading "Existing Regulations."

The Long Beach earthquake had an intensity between VII and IX on the Modified Mercalli Scale. Its magnitude was approximately 6.3 on the Richter Scale. The epicenter was 3.5 miles southwest of Newport Beach. It killed 120 persons and injured many hundreds more. Damage to buildings and structures has been estimated at $41 million. It affected a land area of 75,000 square miles.

Curiously, the Long Beach earthquake was not of a major magnitude from a seismological point of view. However, because of its location in a thickly settled region with many poorly constructed buildings, it ranks as one of the most destructive in the history of the United States. If damage by fire is excluded from the figures when a comparison is made with the San Francisco earthquake in 1906, then the Long Beach earthquake is by far the most destructive in the history of the United States. This is because in the 1906 earthquake 90% of the damage was by fire, whereas at Long Beach, fire loss was almost negligible because of protective measures which had been taken beforehand.

The San Francisco earthquake which occurred on April 18, 1906 at 5:13 in the morning rates as X on the Modified Mercalli Scale. The length of slippage along the San Andreas Fault was 180 miles. If additional earth ruptures which occurred to the north into Mendocino County at the same time were added then the slippage length would approach 300 miles. Motion along the San Andreas Fault in a number of places varied from 10 to 15 feet. Seven hundred people were killed and many hundreds more injured. All known effects of earthquakes on man were

observed. Trees swayed, touching the ground, and some broke. Springs and artesian wells were affected. Some had the water flow increased and some decreased. There were extensive landslides and avalanches and tremendous cracking and breaking open of the earth. Extensive studies have shown that the cost of the damages lies somewhere between $400 million and $1 billion.

Geology. As has been pointed out the type of soils in an area have a relationship to the severity of earthquakes. The lighter, sandy soils are more likely to rupture than rocky ones. The Hollister Planning Area is made up wholly of alluvial soils. (See map facing page) These are designated in the soil survey of San Benito County made by the United State Department of Agriculture.(2)

The major classifications are Soper gravelly loam, 15 to 30 per cent slopes, eroded; Sorrento silt loam, 2 to 9 per cent slopes; and Sorrento silty clay loam, 0 to 2 per cent slopes. These are characterized as follows:

> Soper gravelly loam, 15 to 30 per cent slopes, eroded (SIE2). This moderately eroded soil is similar to Soper sandy loam, 30 to 50 per cent slopes, eroded, but it is gravelly and less sloping. It is generally dark grayish brown or grayish brown. This soil generally occurs along major drainage ways where slopes are 20 to 25 per cent.
>
> Included with this soil are soils that have less clay in the subsoil and that are brown in color. Also included are slightly eroded and severely eroded areas.

---

(2) United States Department of Agriculture, Soil Conservation Service, Soil Survey, San Benito County, California, November 1969.

This soil is moderately fertile. Available water holding capacity is five to seven inches. The runoff is rapid, and the hazard of erosion is severe. (Note: This type of soil occurs only on Park Hill.)

Sorrento silt loam, 0 to 2 per cent slopes (SnA). This soil occurs along drainage ways on valley floors.

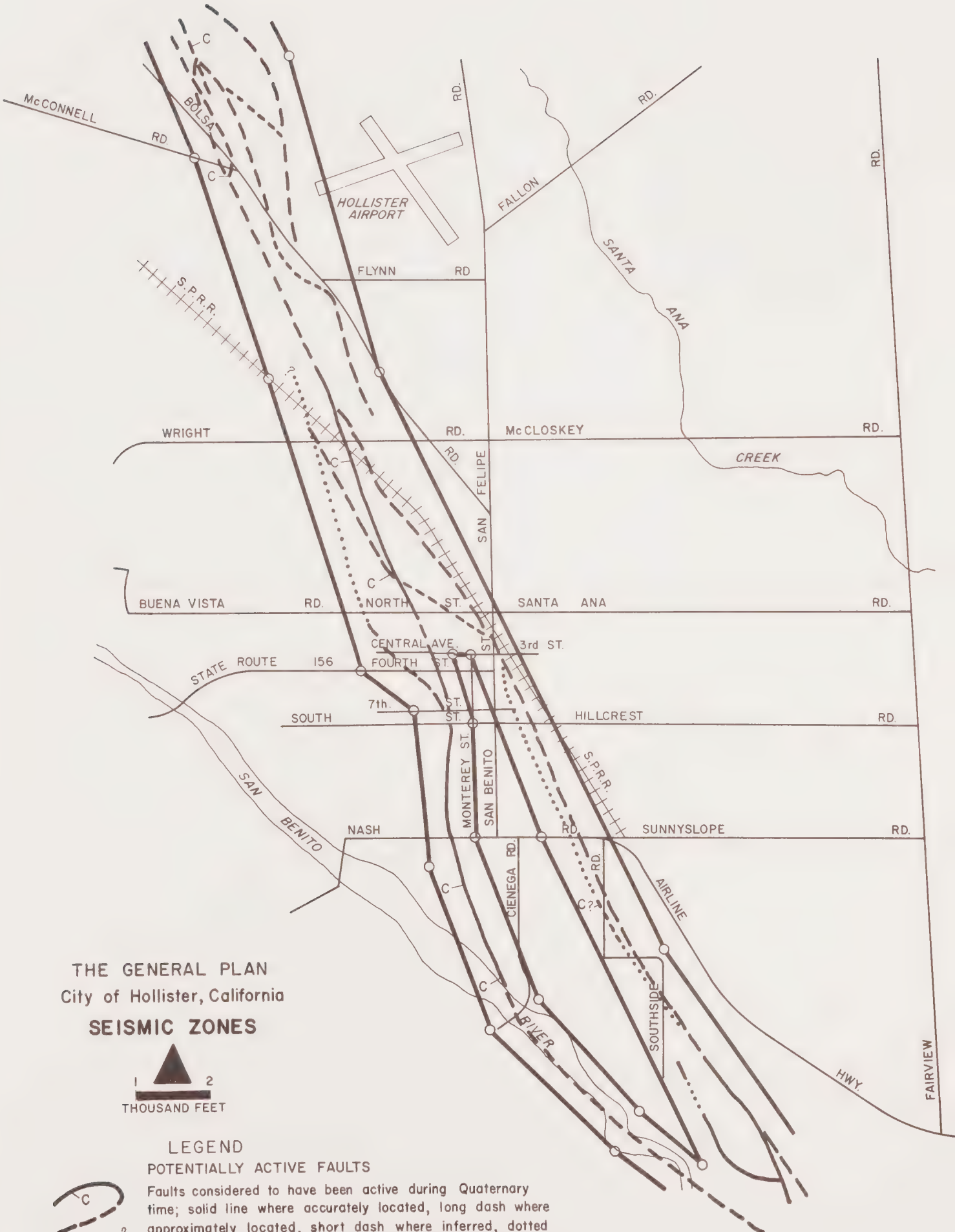
Included with this soil are some small areas of Mocho, Metz, and Yolo soils and some areas of a soil that has a clay surface layer.

This fertile soil has available water holding capacity of 10 to 12 inches. Permeability is moderate, runoff is very slow, and the hazard of erosion is slight to none. The root zone is very deep.

This soil is used for irrigated fruits, nuts, grapes, sugar beets, tomatoes, vegetables, and alfalfa and for dryland grain and incidental pasture.

Sorrento silty clay loam, 0 to 2 per cent slopes (SrA). This soil is similar to Sorrento silt loam, 0 to 2 per cent slopes, but it is silty clay loam throughout the profile. It occurs on flood plains and valley floors in the larger valleys and along the larger drainageways. In color, this soil ranges from grayish brown to dark grayish brown. The substratum is stratified and in places ranges from light clay loam to loamy sand. In a few areas 10 per cent of the solum (the upper part of soil), by volume, is fine and medium gravel.

Included with this soil are a few small areas of loam and silt loam and a few small areas of Pacheco and Clear Lake soils.



THE GENERAL PLAN
City of Hollister, California
SEISMIC ZONES

1 2
THOUSAND FEET

LEGEND

POTENTIALLY ACTIVE FAULTS

Faults considered to have been active during Quaternary time; solid line where accurately located, long dash where approximately located, short dash where inferred, dotted where consealed; query (?) indicates additional uncertainty. C indicates displacement caused by creep or possible creep.

SEISMIC ZONE BOUNDARIES

These are straight-line segments that define one or more seismic zone boundaries.

Available water holding capacity is about 10 to 12 inches. Permeability is moderately slow.

This soil is used for irrigated fruits and nuts, grapes, sugar beets, tomatoes, vegetables, and alfalfa and for dryland grain and incidental pasture.[1]

Hollister Fault Zones. The California Public Resources Code requires that the State Geologist delineate on maps of each county the areas in which earthquake faults have been found. These are referred to as Special Study Zones. The ones that have been delineated for Hollister are shown on the map on the facing page. These areas and the faults themselves are collectively referred to as the Calaveras Fault Zone.

One of the faults passes through the center of the city through the westerly corner of Park Hill continuing southerly through Dunne Park and crossing Nash Road in the vicinity of West Street. This fault is considered by geologists to be active, that is to say it might result in an earthquake at any time.

The other fault enters the city on the east side of Park Hill very close to the Southern Pacific Railroad track and parallels it to Third Street where it changes course and runs slightly southwesterly crossing Hawkins Street at its intersection with Prune Street. This fault is considered to be dormant, that is no preceptible movement of it has been noted during recorded history. It is possible that these "dormant" faults (like a "dormant" or "sleeping" volcano) may become active once again in the future. At present, geologists cannot predict when this might occur, if ever.

This information is contained in a paper published in October 1969 and prepared by Thomas H. Rogers, a geologist with the California Division of Mines and Geology, who has made an extensive study of the Calaveras fault zones in San Benito County. A reprint of a portion of this paper follows:

---

(1) For additional soil characteristics see Appendix C at the end of this text.

How is movement along faults related to earthquakes?

Any amount of movement along a fault is associated with a release of energy. The amount of energy released during slow movement is small, and usually too small to be noticed by man. Therefore slow movements are usually *not* accompanied by earthquakes. However during large movements, the energy released is many times greater. This larger energy release is usually felt by man as an earthquake—the larger the movement, the larger the energy and therefore the larger the earthquake.

Does fault movement cause earthquakes? or do earthquakes cause fault movement?

This is a controversial question among geologists and seismologists. In California, many geologists think that *both* can happen, in the following way. First, a large fault movement releases a large amount of energy that is felt as (or causes) a large earthquake. Secondly, the shock of this large earthquake can trigger (or cause) a small fault movement on a different but nearby fault. The energy release associated with this small fault movement may

Map showing the location of surface traces of the Calaveras fault zone through Hollister.

or may not be strong enough to be felt as an additional earthquake. (see "The Borrego Mountain earthquake," in *Mineral Information Service*, July 1968, p. 103–106).

CALAVERAS FAULT ZONE IN HOLLISTER

The City of Hollister is located directly across several faults, collectively called the Calaveras fault zone. Active movement is now occurring along one fault within this zone. The surface trace of this active fault passes through the middle of Hollister in a general north-south direction. Geological studies have shown that the other faults within this zone have moved within the last million years. However, since no movement has been observed on these faults during recorded history, they are classified as "dormant". It is possible that these "dormant" faults (like a "dormant" or "sleeping" volcano) may become active once again in the future. At present, geologists cannot predict when this might occur, if ever.

Along the active fault trace, the displacement of man-made features has been horizontal or lateral rather than vertical. Furthermore this displacement is described as right lateral by geologists. This means that features crossing the fault are always displaced to the right as seen by a person looking along the feature.

The amount of right lateral displacement in a curb or sidewalk depends in part on its age—the older structures being offset more than younger structures. The maximum offset observed in Hollister is approximately 12 inches (30 cm). Width of the zone of offset varies from 7 to 55 feet (2 to 17 m).

Although the displacement of man-made features along the active fault trace has been exclusively right lateral, earlier prehistoric movements probably include vertical displacement as well (down on the west side). Evidence for this includes low vertical west-facing scarps (cliffs) along the active fault trace from Nash Road to Seventh St., and the dormant fault trace branching from the active fault trace at Seventh St.

Following is a site-by-site description of selected evidence of active fault displacement proceeding from north to south through Hollister (see map for location of sites). All offsets described are right lateral in nature.

Site 1 (Locust Ave. northwest-trending segment)

The south curb is cracked and offset 5 inches (13 cm) across a zone 10 feet (3 m) wide. An adjacent concrete house slab is cracked and offset 2 inches (5 cm) at the crack. According to the owner, the offset on this crack became noticeably larger after two local earthquakes (Richter magnitude 5.5, 5.6) on April 7, 1961. The north curb is offset; and a zone of cracks appears in the pavement between the curb offsets.

An originally straight survey line across the fault trace is located in the pavement near the south curb, and is marked by a series of permanent points encircled by white paint. This line has been resurveyed monthly to measure the amount of displacement of the line across the fault trace. From September 1967 (date of installation) to July 1969 this line had been displaced right laterally three-quarters of an inch (2 cm) across a 15-foot (5 m) wide zone.

Site 2 (Central Ave.)

The north sidewalk is offset 11 inches (28 cm) across a 13-foot (4 m) wide zone. A 1928 date is stamped in the sidewalk here. Individual sidewalk blocks are shifted laterally to the right in a dramatic fashion. The adjacent curb, constructed in 1950, is offset 4 inches across a 10-foot (3 m) wide zone. Extending southeast from this point along the active trace to Site 3, the asphalt street surface is marked by a series of cracks, grouped into distinct sets. Individual cracks are 1 foot (30 cm) to 3 feet (1 m) long.

View westward at Site 2 (Central Ave.; north sidewalk). Sidewalk is offset 11 inches (28 cm) right laterally over a 13-foot (4 m)-wide zone. Note date stamped in lower left corner of sidewalk—2/2/1928.

Site 3 (Locust Ave. east side)

The active fault trace crosses the curb and sidewalk of the east side of Locust Ave. diagonally. Local subsidence at the fault trace is visible at the south end of a driveway north of the residence at 357 Locust Ave. A concrete walk between the curb and sidewalk at 357 Locust Ave. is offset right laterally at a construction joint.

The fault trace crosses the sidewalk diagonally just south of the concrete walk into the residence at 357 Locust Ave. At this point the sidewalk has been strongly compressed by fault movement; and has responded periodically by buckling upwards. According to local residents, the first buckle appeared abruptly in September 1961, accompanied by an explosive noise loud enough to bring people running to investigate. The buckle was flattened by sawing 2 inches (5 cm) off the end of one of the upraised blocks. Another buckle gradually reappeared in the same spot, and was flattened a second time several years later. In June 1967, a third buckle at the same spot was 4 inches (10 cm) high. By September 1968 it measured 8 inches (20 cm) in height with a south slope of almost 15 degrees. This buckle was flattened for the third time in October 1968.

The concrete walk into the residence at 359 Locust Ave. has been offset right laterally along two construction joints near the house. A low buckle is evident in the walk near the house steps.

Site 4 (Fremont Way-Alley)

A low stone retaining wall on the north side of the alley is dramatically offset about 11 inches (28 cm) across a 15-foot (5 cm) wide zone. Some individual stone blocks are separated; and one stone is cracked and pulled apart.

In the middle of the alley a concrete strip (constructed in 1965) was not deformed or cracked when first observed in October 1966. By July 1969 two open cracks were evident across the strip at the fault.

On the south side of Fremont Way a wood-frame garage with concrete foundation walls is offset 10 inches (25 cm) across a zone 15 feet (5 m) wide. The foundation wall within the zone has rotated clockwise 7 degrees. The garage was constructed in 1929. Note the open cracks in the foundation wall and wood-frame siding, and the eastward tilt of the front wall of the garage.

Site 5 (Fourth St.)

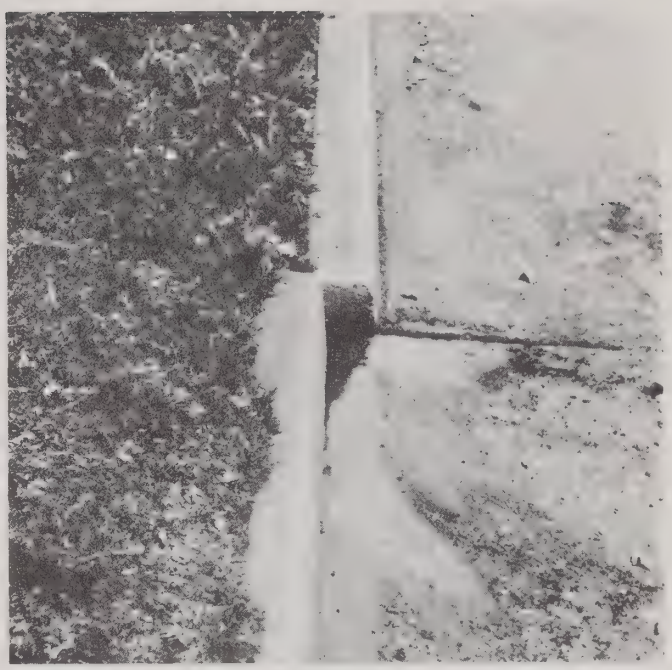
The north curb is offset about 11 inches (28 cm) over a zone 55 feet (17 m) wide. The south curb, and the sidewalks and retaining walls on both sides of the street are similarly offset. Local subsidence is evident in the south retaining wall and sidewalk at the fault.

View westward at Site 5 (Fourth St.; north curb). Curb is offset 11 inches (28 cm) over a 55-foot (17 m)-wide zone. Zone of sharp deformation visible here is 15 feet (5 m) wide.

Site 6 (Fifth St.)

The curbs and sidewalks on both sides of Fifth St. are offset; the north sidewalk being offset 10 inches (25 cm). The curbs and sidewalks have been replaced by new concrete at the fault zone.

According to local residents a creek existed here before 1900 and flowed in a narrow channel from north to south generally along the present active fault trace. The creek was fed by springs located near the west edge of Park Hill, and flowed south into an elongate swamp in the vicinity of Suiter St. As time passed the springs and creek dried up, and the creek channel and swamp were filled in to accommodate the growing City of Hollister. All three of the above old features (the springs, linear creek, and elongate low swampy area) are typically found along active faults.



View eastward at Site 7 (Sixth St.; north curb). Curb and street slab are offset 4¼ inches (11 cm) across a single construction joint within a 25-foot (8 m) zone of offset.

Subsidence has periodically recurred in the Fifth Street pavement at the fault trace. This may be largely due to subsidence of the dump material used to fill in the old creek channel.

Site 7 (Sixth St.)

At Sixth St. the pavement consists of large concrete slabs. Lateral movement is concentrated along construction joints between slabs, which causes shifting, separation, and rotation of the slabs over a wide zone.

In the north curb a 4¼-inch (11 cm) curb offset results from the coincidence of construction joints in both the curb and street slab. This is the largest offset across a single construction joint in Hollister. The south curb is offset in a different fashion—a short curb segment being rotated clockwise.

A survey of the center construction joint in the street showed 12 inches (30 cm) of displacement across a 60-foot (18 m) wide zone. Similar offsets are apparent in both sidewalks and a retaining wall adjacent to the north sidewalk.

South of Sixth St. in Dunne Park, a short wooden east-west fence behind some bushes in the barbecue area is offset approximately 5 inches (13 cm). This fence was probably constructed in the mid 1950s.

Two terraces with small west-facing scarps appear in Dunne Park between Sites 7 and 8. The lower scarp is probably located along the active fault trace.

Site 8 (Seventh St.)

The south curb is offset 6 inches (15 cm) across a 35-foot (11 m) wide zone. The north curb and sidewalk are similarly offset. Several sets of cracks are apparent in the asphalt pavement between the offset curbs.

Seventh St. marks a bend in the active trace from a northwest to a north-south trend. The fault crosses Seventh St. on a north-south trend.

A survey line marked by nails in the asphalt pavement (as at Site 1) is located across the fault near the south curb. This line has been offset similarly to the line at Site 1.

Site 9 (South St.)

The south curb is offset 12 inches (1 m) across a 50-foot (15 m) wide zone. The south sidewalk is similarly offset. The north curb and sidewalk are offset lesser amounts. According to the local residents these structures are younger than the south curb and sidewalk, but specific dates are not available.

Site 10 (A St.)

The curb and sidewalk on this street and streets south of A St. were constructed in 1953 or later. Thus offsets on these streets are considerably less than offsets on the older streets to the north.

The north curb of A St. is cracked, 30 feet (10 m) east of the east curb of Suiter St.; and a small right lateral offset occurs across this crack. The south curb of A St. is offset 4 inches (10 cm) across a 35-foot (11 m) wide zone. Some cracks appear in the asphalt pavement between the curb offsets. The fault trace crosses A St. on a northeast trend, which represents a local divergence from the general north-south trend through the southern part of Hollister.

Site 11 (B St.)

The north curb is offset 3 inches (8 cm) across a 20-foot (6 m) wide zone. Local subsidence is apparent in the north sidewalk near a water meter box. The south curb is similarly offset.

Site 12 (D St.)

The south curb is offset 4 inches (10 cm) across a 15-foot (5 m) wide zone. The north curb was constructed in 1967 and was not offset at all as of July 1969.

The active fault trace on D St. is shown on the map as two separate dashed lines. As of July 1969 it was not certain whether there was a connection between these two fault traces or not. Local bends in the fault trace occur to the north (see Site 10); and it is possible that a bend may occur just north of D St. to connect these two separate traces.

Site 13 (Nash Road)

The north gutter (in the middle of a driveway) is offset about 2 inches (5 cm) over a narrow zone. The driveway slab was constructed in 1952 as indicated by a nearby date scratched into the then-wet concrete. The concrete slabs forming the driveway appear to be offset along a construction joint. Local subsidence is apparent in the gutter at the fault.

The south curb and gutter were constructed in 1959 and as of July 1969 no overall offset had occurred. However, cracks with small offsets can be seen on either side of the driveway and brick walk at 511 Nash Road. These cracks and offsets may be due to local subsidence rather than fault movement.

A survey line across the fault trace (similar to those at Sites 1 and 8) is visible in the pavement near the south curb. As of July 1969 the line had not been displaced a measurable amount since installation in June 1968.

ANNOTATED LIST OF REFERENCES

Allen, C. R., et al., 1968, The Borrego Mountain Earthquake: California Div. Mines and Geology *Mineral Information Service*, v. 21, no. 7, p. 103–106.

Allen, J. E., 1946, *Geology of the San Juan Bautista quadrangle, California*: California Division of Mines Bull. 133.

American Association of Petroleum Geologists (AAPG) and Society of Exploration Paleontologists and Mineralogists (SEPM), 1967, *Guidebook—Gabilan Range and adjacent San Andreas fault* (contains six road logs and several articles describing geology, mineral resources, and active fault features in the vicinity of Hollister, San Juan Bautista, Pajaro Gap, Pinnacles National Monument, and New Idria).

Andrews, Philip, 1936, *Geology of the Pinnacles National Monument*: California University Publications in Geological Sciences, v. 24, no. 1, (out of print; available for reference at many libraries).

Averill, C. V., 1947, *Mines and mineral resources of San Benito County, California*: *California Journal of Mines and Geology*, v. 43, no. 1 (out of print; available for reference at many libraries).

Bolt, B. A., 1969, *Earthquakes and the structural features of northern California*: *Mineral Information Service*, v. 22, no. 4, p. 51–53.

Bowen, O. E., Jr. and Gray, C. H., Jr., 1959, *Geology and economic possibilities of the limestone and dolomite deposits of the northern Gabilan Range, California*: California Division of Mines Special Report 56.

California Division of Mines and Geology Bull. 190, 1966, *The geology of northern California* (see Chapter VI—Coast Range Province, Chapter VIII—San Andreas Fault, and Chapter X—Field Trip Guides for various articles and road logs concerning this general area).

Eckel, E. B. and Meyers, W. B., 1946, *Quicksilver deposits of the New Idria district, San Benito and Fresno Counties, California*: *California Journal of Mines and Geology*, v. 42, no. 1, p. 81–124.

Hinds, N. E. A., 1952, *Evolution of the California landscape*: California Division of Mines Bull. 158, p. 157–181 (out of print; available for reference at many libraries).

Mineral Information Service, Geology and road log of Pinnacles National Monument, 1968: vol. 21, no. 8, p. 119–121 (August).

Oakeshott, G. B., 1966, *San Andreas fault, Geologic and earthquake history*: *Mineral Information Service*, v. 19, no. 10, p. 159–166.

Rogers, T. H., 1969, *Where does the Hayward fault go*: *Mineral Information Service*, v. 22, no. 4, p. 55–60 (contains list of current map references to active fault movement on the Calaveras, Hayward and San Andreas fault zones in San Francisco Bay and Hollister areas).

Steinbrugge, K. V. and Zacher, E. G., 1960, *Creep on the San Andreas fault—fault creep and property damage*: Seismological Society of America Bull., v. 50, no. 3, p. 389–396 (describes details of building damage due to active fault displacement on the San Andreas fault at the Almaden Cienega Winery).

Taliaferro, N. L., 1943, *Geologic map of the Hollister quadrangle*: California Division of Mines Bull. 143 (map only).

Tocher, Don, 1960, *Creep on the San Andreas fault—creep rate and related measurements at Vineyard, California*: Seismological Society of America Bull. v. 50, no. 3, p. 398–404 (describes instrumentation of active fault displacement at the Almaden Cienega Winery).

History of Hollister Earthquakes. The United States Geological Survey has compiled a history of earthquakes in the United States which covers the time span between the 1700's and 1964. The history refers only to major earthquakes which have a value of 4 or more on the Modified Mercalli scale. A listing of severe earthquakes in the Hollister area is as follows: Arabic numbers refer to amplitude on the Richter Scale. Roman numerals refer to intensity on the Modified Mercalli Scale.

March 30, 1883, VII, plaster fell from walls and numerous windows were broken.

November 13, 1892, VII+, extensive damage to plaster.

June 20, 1897, VIII to IX. Every brick structure in the city was damaged. The epicenter was on the San Andreas Fault in San Benito County.

March 11, 1911, VII, extensive cracking in plaster and objects fell off walls. There was damage to chimneys and windows.

June 24, 1939, VII-VIII, the worst damage occurred ten miles southwest of Hollister. There was damage to chimneys of ranch buildings. Small cracks appeared in the ground. Heavy furniture moved and water was spilled from containers. The temblor was felt over 10,000 square miles.

January 7, 1945, 5.1. Chimneys and plaster cracked, and goods in stores displaced on shelves. Pendulum clocks stopped.

May 17, 1945, 4.5, considerable glassware damaged, plaster cracked.

August 10, 1947, 5. Several plate glass windows were broken; groceries, dishes and pictures were knocked about; an ornamental stone pillar of a residence was split; a residential water main was broken; and the foundation of a downtown building was cracked.

March 9, 1949, 5.3. Wall severely cracked, three chimneys fell, plaster cracked, and windows broke. One store suffered $2,000 damage in cracked walls and plaster. Stock in many stores thrown off shelves.

April 8, 1961, about 13 miles south of Hollister on San Andreas fault, 5.6 and 5.5. More than one-half of all city buildings suffered some type of damage but major damage was confined to three buildings. The W. A. Taylor Winery, south of Hollister, was also severely damaged. A 50-foot long fissure was observed on Cienega Road about three miles from the winery; number of chimneys damaged, some fell. Damage was estimated at $250,000 but there were no deaths or injuries.

November 29, 1974, 5.5, 3:01 P.M. EST. Shock duration estimated from 5 to 20 seconds. Major glass damage. Merchandise spilled on floors from shelves. Containers in a paint store toppled off shelves and burst open. $1,700 in damage to bottles and jars of jam, jelly or wine were reported in one location.

Landslides. Landslides do not appear to be a factor in the Hollister Planning Area. The only possible place where such an event could occur would be on Park Hill, and the composition of soil in this area does not appear likely to result in a landslide, although if during an earthquake there were ruptures some material might be loosened and slide down to the lower ground below.

Earthquake Damage. Having reviewed the history of Hollister and the numerous earthquakes which have occurred in the past we can be certain that more earthquakes will occur in the future along the Calaveras fault. The city will continue to expand and grow. So the problem is to reduce the hazards which arise from earthquake activity to

the maximum to protect the lives and safety of the city's inhabitants.

Obviously the first thing to be done is to identify the areas where the greatest damage is likely to occur. At the present time there is no certain way of doing this. But it is generally agreed by experts in the field that the rupturing of the earth's surface during an earthquake will take place most often where it has occurred in the past.

The composition of the soil is an important factor and, as has been shown previously, there is adequate data on this subject for an adequate study by properly qualified experts. It is interesting to note that as early as 1937 a British expert recognized this important fact. Charles Davison, a Fellow of the Geographic Society, wrote:

> "At present, more can be done to counter the destructions of earthquakes by choice of a suitable site and proper design of buildings. In every earthquake the damage to property is least on hard rocks; it is more on buildings built on soft ground; greatest of all on recently 'made' land, especially on that filling up a marsh or creek. Sites on hard ground should therefore be selected, while the neighbourhoods of unsupported openings, such as the edges of cliffs or river banks, should be avoided."(3)

---

(3) Davison, Charles, ScD, FGS, The Encylopedia Britannica, 14th Edition, Vol. 7, P 852, 1937.

A final factor in hazard reduction is to identify and eliminate those buildings or portions of building which would probably cause a loss of life if they were occupied at the time of a severe earth movement. These are all problems requiring the expert knowledge of engineers and geologists and a detailed survey by such experts.

Earthquake Zoning. Is there some distance from an active earthquake fault in which construction should be prohibited? There appears to be no unanimity about this, even among experts. Most frequently, the matter boils down to one of economics.

In the City of Hayward, for example, where the fault zone runs through much high value land which has been built upon it was finally recommended that 50 feet on each side of the fault should not be used for construction. In Hollister, as in Hayward, the problem is particularly severe because there already exist on the fault itself churches, schools, apartment houses, and other substantial structures in which large numbers of people either live or gather. It was not economically or politically feasible to provide for a band any wider than fifty feet.

A better approach to the problem is to retain a geologist who specializes in seismic problems to examine the area along the earthquake zone and, through his knowledge of soils and the effect of seismic waves in them, plot realistically the actual band of greatest hazard. Then, in urbanized areas, those responsible for approving land developments could prevent construction on these hazardous places by having a development design which uses such spaces for golf courses, parks, playgrounds and similar open space activities. (Note: The Seismic Zones Map facing page 15 is a good beginning effort to provide this information.)

The real problem in establishing some arbitrary zone is that it is not known at this time were the greatest shock from a fault slippage will occur. There are examples of buildings on the very brink of an earthquake fault having gone undamaged, whereas buildings removed by several hundred miles were completely destroyed.

Seismic experts think they are on the verge of a breakthrough in predicting the areas where the shock effect is at a maximum. The breakthrough has not come yet and there is not much scientific basis for choosing any particular location.

Single story frame structures appear to withstand earthquake shock much better than any other kind. Thus, if economic necessity compels the use of land adjacent to fault zones it would seem prudent to limit uses to single family dwellings and to detached dwelling houses with a limited number of living units within them. Certainly all building other than single family dwellings should be prohibited from being built on fault zones.

Existing Regulations. The City of Hollister should consider adopting regulations which would include preventive measures to minimize the danger from earthquake shocks. The most important of these is the Building Code, followed by the Zoning and Subdivision Ordinances.

The city uses the Uniform Building Code as prepared by the International Conference of Building Officials. Some background about the Building Code is in order. It is presumed that the standards set out in the Code include adequate requirements for earthquake resistent structures.

After the disastrous Long Beach earthquake in 1933 extensive studies were made to develop new building code regulations which would require that buildings be

constructed so as to withstand the kind of stresses which occurred during that earthquake. But there may now have to be a reassessment in the light of knowledge which has since developed as a result of the San Fernando Valley earthquake in 1971.

Since the Long Beach earthquake the science of seismology has been greatly advanced. Among these advances has been the development of instrumentation which has been installed throughout California and which measures the energy released in earthquakes. The information obtained by this equipment, taken with on-the-ground studies after the San Franando earthquake, indicate that the energy released in that earthquake was at least ten times greater than the energy released at Long Beach.

It has been speculated that if a similar instrumentation network had been available at the time of the Long Beach earthquake that it might have been discovered that the energy release was greater than could be observed from a physical examination of what had occurred in the area. In any event there appears to be need to reconsider Building Code regulations in the light of the continuing advancement of seismology.

Suggested Areas of Regulation. Ground rupture, cracking, shaking, landslides and liquefaction may all cause substantial damage to life and property during an earthquake. The danger is usually at the maximum within the fault corridor and much less so outside the corridor. It would seem important, therefore, that these corridors be precisely determined as to their boundaries and that ordinance regulations be adopted applying to each.

Inside the Fault Corridor. Some kind of a combining zone regulation, similar to the "S" (Site Approval) zone might be developed which would require that inside the fault corridor the Building Official would

have authority to require proof of the adequacy of construction and site safety. The burden for this would be on the applicant and the decision on adequacy should be made by the Building Official and the Director of Public Works. If a dispute should arise between the applicant and the Building Official there should be a Board of Examiners set up to determine the matter. Membership on it should be limited to qualified professionals such as a structural engineer, an engineering geologist, and a soils engineer.

Soils engineering and geological engineering reports should be required for the proposed sites of all structures intended for human occupancy any time, day or night, residential and otherwise, except for single family dwellings and duplexes, unless for some reason the Building Official thinks them unnecessary.

Any building for human occupancy and any structure designed for emergency use, the proposed location of which is over a known active fault trace should be prohibited.

Regulations Outside the Fault Corridor. Soils engineering and geological reports should be required anywhere in the Hollister Planning Area for:

(1) All buildings for human occupancy higher than three stories excluding pent house and basement as defined in the Uniform Building Code.

(2) All buildings for human occupancy 50 or more feet in height.

(3) All buildings of high human occupancy load. Examples would be schools, churches, hospitals, auditoriums, hotels, apartment houses, theaters, stadia and bleachers.

(4) All buildings whose occupancy is directly related to emergency services -- fire and police stations, hospitals, communication centers, and the like.

Existing Structural Deficiencies. Existing structures which would be hazardous during an earthquake should be identified. Included would be those of high occupancy, public structures, or any structures the dangers of which affect the general public. This can only be done by individual inspection made by personnel trained in the field.

Civil Disaster Program. We have been concerned in this plan with preventive measures designed to reduce the hazards during the next earthquake. Also to be considered is what action should be taken after the next one, in order to provide for the health and safety of the community.

Hollister participates with San Benito County in a Civil Disaster Program. The matters of fire protection and civil disaster functions are the special consideration in the Safety Element of the General Plan, therefore they will not be covered in any great detail here, since the Safety Element is being prepared for adoption as a part of this program.

Element Review. As with all elements of the General Plan there should be periodic review. This is particularly true in connection with seismic safety since experts in the field are making rapid strides in their knowledge of the cause and effects of earthquakes. Some experts believe that major breakthroughs in the area of predicting the point of greatest shock and also predicting when an earthquake is likely to strike are being made. The Seismic Safety Element, due to these rapid advances, may have the highest rate of obsolescence of any of the elements making up the General Plan. It would therefore be prudent for those in public office charged with the responsibility in this area to review this element with reasonable frequency.

APPENDIX A

MODIFIED - MERCALLI INTENSITY SCALE

I. Not felt by people, except under especially favorable circumstances. However, dizziness or nausea may be experienced.

Sometimes birds and animals are uneasy or disturbed. Trees, structures, liquids, bodies of water may sway gently, and doors may swing very slowly.

II. Felt indoors by a few people, especially on upper floors of multi-story buildings, and by sensitive or nervous persons.

As in Grade I, birds and animals are disturbed, and trees, structures, liquids and bodies of water may sway. Hanging objects swing, especially if they are delicately suspended.

III. Felt indoors by several people, usually as a rapid vibration that may not be recognized as an earthquake at first. Vibration is similar to that due to passing of a light, or lightly loaded truck, or heavy trucks some distance away. Duration may be estimated in some cases.

Movements may be appreciably on upper levels of tall structures. Standing motor cars may rock slightly.

IV. Felt indoors by many, outdoors by few. Awakens a few individuals, particularly light sleepers, but frightens no one except those apprehensive from previous experience. Vibration like that due to passing of heavy, or heavily loaded trucks. Sensation like a heavy body striking building, or the falling of heavy objects inside.

Dishes, windows and doors rattle; glassware and crockery clink and clash. Walls and house frames creak, especially if intensity is in the upper range of this grade. Hanging objects often swing. Liquids in open vessels are disturbed slightly. Stationary automobiles rock noticeably.

APPENDIX A
MODIFIED - MERCALLI INTENSITY SCALE

V. Felt indoors by practically everyone, outdoors by most people. Direction can often be estimated by those outdoors. Awakens many, or most sleepers. Frightens a few people, with slight excitement; some persons run outdoors.

Buildings tremble throughout. Dishes and glassware break to some extent. Windows crack in some cases, but not generally. Vases and small or unstable objects overturn in many instances, and a few fall. Hanging objects and doors swing generally or considerably. Pictures knock against walls, or swing out of place. Doors and shutters open or close abruptly. Pendulum clocks stop, or run fast or slow. Small objects move, and furnishings may shift to a slight extent. Small amounts of liquids spill from well-filled open containers. Trees and bushes shake slightly.

VI. Felt by everyone, indoors and outdoors. Awakens all sleepers. Frightens many people; general excitement, and some persons run outdoors.

Persons move unsteadily. Trees and bushes shake slightly to moderately. Liquids are set in strong motion. Small bells in churches and schools ring. Poorly built buildings may be damaged. Plaster falls in small amounts. Other plaster cracks somewhat. Many dishes and glasses, and a few windows, break. Knickknacks, books and pictures fall. Furniture overturns in many instances. Heavy furnishings move.

VII. Frightens everyone. General alarm, and everyone runs outdoors.

People find it difficult to stand. Persons driving cars notice shaking. Trees and bushes shake moderately to strongly. Waves form on ponds, lakes and streams. Water is muddied. Gravel or sand stream banks cave in.

Large church bells ring. Suspended objects quiver. Damage is negligible in buildings of good design and construction; slight to moderate in well-built ordinary buildings; considerable in poorly built or badly designed buildings, adobe houses, old walls (especially where laid up without mortar), spires, etc. Plaster and some stucco fall. Many windows and some furniture break. Loosened brickwork and tiles shake down. Weak chimneys break at the roofline. Cornices fall from towers and high buildings. Bricks and stones are dislodged. Heavy furniture overturns. Concrete irrigation ditches are considerably damaged.

VIII. General fright, and alarm approaches panic.

Persons driving cars are disturbed. Trees shake strongly, and branches and trunks break off (especially palm trees). Sand and mud erupt in small amounts. Flow of springs and wells is temporarily and sometimes permanently changed. Dry wells renew flow. Temperature of spring and well waters varies. Damage slight in brick structures built especially to withstand earthquakes; considerable in ordinary substantial buildings, with some partial collapse; heavy in some wooden houses, with some tumbling down. Panel walls break away in frame structures. Decayed pilings break off. Walls fall. Solid stone walls crack and break seriously. Wet ground and steep slopes crack to some extent. Chimneys, columns, monuments and factory stacks and towers twist and fall. Very heavy furniture moves conspicuously or overturns.

IX. Panic is general.

Ground cracks conspicuously. Damage is considerable in masonry structures built especially to withstand earthquakes; great in other masonry buildings - some collapse in large part. Some wood frame houses built especially to withstand earthquakes are thrown out of plumb, others are shifted wholly off foundations. Reservoirs are seriously damaged and underground pipes sometimes break.

X. Panic is general.

Ground, especially when loose and wet, cracks up to widths of several inches; fissures up to a yard in width run parallel to canal and stream banks. Landsliding is considerable from river banks and steep coasts. Sand and mud shifts horizontally on beaches and flat land. Water level changes in wells. Water is thrown on banks of canals, lakes, rivers, etc. Dams, dikes, embankments are seriously damaged. Well-built wooden structures and bridges are severely damaged, and some collapse. Dangerous cracks develop in excellent brick walls. Most masonry and frame structures, and their foundations, are destroyed. Railroad rails bend slightly. Pipe lines buried in earth tear apart or are crushed endwise. Open cracks and broad wavy folds open in cement pavements and asphalt road surfaces.

XI. Panic is general.

Disturbances in ground are many and widespread, varying with the ground material. Broad fissures, earth slumps, and land slips develop in soft, wet ground. Water charged with sand and mud is ejected in large amounts. Sea waves of significant magnitude may develop. Damage is severe to wood frame structures, especially near shock centers; great to dams, dikes and embankments, even at long distances. Few if any masonry structures remain standing. Supporting piers or pillars of large, well-built bridges are wrecked. Wooden bridges that "give" are less affected. Railroad rails bend greatly, and some thrust endwise. Pipe lines buried in earth are put completely out of service.

XII. Panic is general.

Damage is total, and practically all works of construction are damaged greatly or destroyed. Disturbances in the ground are great and varied, and

numerous shearing cracks develop. Landslides, rock falls, and slumps in river banks are numerous and extensive. Large rock masses are wrenched loose and torn off. Fault slips develop in firm rock, and horizontal and vertical offset displacements are notable. Water channels, both surface and underground, are disturbed and modified greatly. Lakes are dammed, new waterfalls are produced, rivers are deflected, etc. Surface waves are seen on ground surfaces. Lines of sight and level are distorted. Objects are thrown upward into the air.

APPENDIX B

GLOSSARY

Alluvial	- A general term for all detrital deposits resulting from operation of modern rivers, thus including the sediments laid down in river beds, flood plains, lakes, fans at the foot of the mountain slopes, and estuaries.
Amplitude	- The elevation of the crest of a wave or ripple above the adjacent troughs.
Crustal plate	- A portion of the earth's crust beneath an oceanic or continental region.
Earthquake	- Perceptible trembling to violent shaking of the ground, produced by sudden displacement of rocks below the earth's surface.
Fault	- A fracture or fracture zone along which there has been displacement of the sides relative to one another parallel to the fracture. The displacement may be a few inches or many miles.
Fault block	- A body of rock bounded by one or more faults.
Fault system	- Two or more fault sets that were formed at the same time.
Fault trace	- A line on one plane representing the intersection of another plane with the first one.
Fault zone	- A fault, instead of being a single clean fracture, may be a zone hundreds or thousands of feet wide; the fault zone consists of numerous interlacing small faults.

APPENDIX B
GLOSSARY

Faulting	- The movement which produces relative displacement of adjacent rock masses along a fracture.
Fill	- Material used to raise the surface of the land, generally in a low area.
Fissure	- An extensive crack, break, or fracture in the rocks.
Geology	- The science which treats of the earth, the rocks of which it is composed, and the changes which it has undergone or is undergoing.
Gouge material	- Finely abraded material occurring between the walls of a fault, the result of grinding movement.
Isoseismic line	- An imaginary line connecting all points on the surface of the earth where an earthquake shock is of the same intensity.
Mud flow	- A flowage of heterogenous debris lubricated with a large amount of water, usually following a former stream course.
Sediment	- Solid material settled from suspension in a liquid.
Sedimentary rocks	- Rocks formed by the accumulation of sedimentation in water or from air.
Seismic	- Pertaining to, characteristic of, or produced by earthquakes or earth vibration, as seismic disturbance.
Seisomometer	- Detecting device which receives seismic impulses.

APPENDIX B
GLOSSARY

Stratum - The section of a formation that consists throughout of approximately the same kind of rock material, and may consist of an indefinite number of beds or layers.

Tectonic movement - The movement caused by an earthquake which results in deformation of the earth's crust.

APPENDIX C

SOIL CHARACTERISTICS

AnA Antioch loam, 0 to 2 percent slopes. This nearly level soil occurs on terraces. It has a very slowly permeable subsoil that limits penetration of roots and water. The root zone is moderately deep. Runoff is very slow, and small areas are ponded occasionally during the winter. The hazard of erosion is slight. The soil has moderate to low fertility. It holds about 3.75 to 5 inches of water available for plants.

AnB Antioch loam, 2 to 5 percent slopes. This soil is on long terraces and fans. Runoff is slow, and the hazard of erosion is slight.

AnC2 Antioch loam, 5 to 9 percent slopes, eroded. This soil is steeper than Antioch loam, 0 to 2 percent slopes and has a thinner surface layer. It occurs in small areas along drainageways or as breaks in areas of less sloping soil. Slopes are dominantly 5 to 7 percent. This soil is slightly to moderately eroded, and in some areas the plow layer extends into the subsoil. Runoff is medium, and the hazard of erosion is moderate.

AoD2 Antioch clay loam, 9 to 15 percent slopes, eroded. This soil has a thinner surface layer than Antioch loam, 0 to 2 percent slopes. It occurs in small rolling areas or on sharp breaks along drainageways. Slopes are dominantly 9 to 12 percent. This soil is moderately eroded, and the plow layer commonly extends into the subsoil. Fertility is low, runoff is medium to rapid, and the hazard of erosion is moderate to severe.

Ch Clear Lake clay. This soil lies on valley bottoms on slopes of 1 percent or less. It is highly fertile. Available water holding capacity is about 8 to 10 inches. Permeability is slow, runoff is ponded to very slow, and the hazard or erosion is none to slight. The root zone is deep.

APPENDIX C
SOIL CHARACTERISTICS

Ck Clear Lake clay, saline. This soil is similar to Clear Lake clay, but it contains slight to moderate amounts of salts and alkali. This soil occurs in low-lying valley bottoms. Included with the soil are some areas that have a dark gray to dark grayish-brown heavy clay loam surface layer.

Cl Clear Lake silty clay loam. This soil occurs in small valleys in the uplands or in small areas in the larger valleys. It has a calcareous silty clay loam surface layer and a seasonally high or continuously high water table. Included with this soil are soils that have a clay surface layer, soils that are somewhat poorly drained, and soils that have a grayish-brown surface layer.

CwC Cropley clay, 2 to 9 percent slopes. This soil is on long gently sloping fans or is in gently rolling areas. It is fertile. Available water holding capacity is 8 to 10 inches. Permeability is slow, runoff is slow to medium, and the hazard of erosion is slight to moderate. In a few included areas, water from surrounding hills has cut gullies. The root zone is very deep.

DaD Diablo clay, 9 to 15 percent slopes. This soil occurs on low rolling hills or on toe slopes where the soil is somewhat thicker than typical, and is only slightly eroded. In a few areas this soil has lime in the surface layer. Available water holding capacity is 10 to 12 inches. Runoff is medium, and the hazard of erosion is moderate. The root zone is very deep.

MeA Metz sandy loam, 0 to 2 percent slopes. This soil occurs along the major drainageways. It is occasionally flooded. It has low fertility. Available water holding capacity is about 5 to 6 inches. Permeability is rapid, runoff is very slow and the hazard of erosion is slight to none. The root zone is very deep.

APPENDIX C
SOIL CHARACTERISTICS

MgA Metz gravelly sandy loam, 0 to 2 percent slopes. This soil is similar to Metz sandy loam, 0 to 2 percent slopes, but its surface layer is gravelly. It occurs on first bottoms along large drainageways, and it is occasionally flooded. Fine to medium gravel makes up 15 percent or more of the surface layer. Layers of gravel are also in the stratified material that underlies the surface layer. Available water holding capacity of this soil is 4 to 5 inches.

MnG Mine pits and dumps. Mine pits and dumps consists of limestone, marble, and granite quarries; sand and gravel pits; open-pit and deep shaft mines; and sumps of waste materials. The areas are generally bare, but a few of the older quarries have a thin cover of grass and forbs. Drainage is generally excessive, runoff is rapid, and silt production is high.

Pe Pacheco silty clay. This soil is moderately fertile, permeability is moderately slow, runoff is very slow to ponded, and erosion is not a hazard. It has a silty clay surface layer about 15 inches thick over a clay loam subsoil. It occurs in small areas close to drainageways or in sloping areas around and in depressions. In places this soil is stratified with lenses of silt loam to loamy sand at depths greater than 50 inches. The water table is generally below a depth of 60 inches, but in small areas it is within a depth of 36 inches. This soil has been drained and the water table has been lowered. Available water holding capacity is 10 to 12 inches.

PvC2 Pleasanton gravelly loam, 5 to 9 percent slopes, eroded. This soil is similar to Pleasanton loam, 2 to 5 percent slopes, but it is more sloping and is gravelly throughout. It occurs in small to medium-sized areas along larger drainageways. In most places it is brown, but color ranges to grayish brown. Available water holding capacity is about 7 to 9 inches. Runoff is medium, and the hazard of erosion is moderate.

APPENDIX C
SOIL CHARACTERISTICS

ReA Reiff sandy loam. This soil occurs on fans along the larger drainageways. Some areas are occasionally flooded. It is moderately fertile. Available water holding capacity is about 8 inches. Permeability is moderately rapid, runoff is very slow, and the hazard of erosion is slight to none. The root zone is very deep.

RsC Rincon silty clay loam, 2 to 9 percent slopes. This soil is gently sloping to moderately sloping. It occurs in small to medium-sized areas that generally have slopes of 3 to 6 percent. In a few areas fine to medium gravel is in all parts of the profile, but it generally makes up less than 10 percent of the soil mass by volume. Runoff is slow to medium, and the hazard of erosion is slight to moderate.

RsD2 Rincon silty clay loam, 9 to 15 percent slopes, eroded. This soil is similar to Rincon silty clay loam, 2 to 9 percent slopes, but has a thinner profile and is strongly sloping, and is more eroded. Areas are small to moderate in size, and slopes generally range from 12 to 15 percent. In some areas fine to medium-sized gravel is in all parts of the profile.

SlE2 Soper gravelly loam, 15 to 30 percent slopes, eroded. This soil generally occurs along major drainageways where slopes are 20 to 25 percent. It is generally dark grayish brown or grayish brown. It includes gravelly soils that have less clay in the subsoil and that are brown in color. Also included are slightly eroded and severely eroded areas. It is moderately fertile. Available water holding capacity is 5 to 7 inches. Runoff is rapid, and the hazard of erosion is severe.

SnA Sorrento silt loam, 0 to 2 percent slopes. This soil occurs along drainageways on valley floors. This fertile soil has available water holding capacity of 10 to 12 inches. Permeability is moderate, runoff is very slow, and the hazard or erosion is slight to none. The root zone is very deep.

APPENDIX C
SOIL CHARACTERISTICS

SnC Sorrento silt loam, 2 to 9 percent slopes. This soil is similar to Sorrento silt loam, 0 to 2 percent slopes, but is more sloping. It occurs in small to medium-sized areas along the larger drainageways. Slopes dominantly range from 3 to 5 percent. In places this soil is subject to flooding. Runoff is slow to medium, and the hazard of erosion is slight to moderate.

SrA Sorrento silty clay loam, 0 to 2 percent slopes. This soil is similar to Sorrento silt loam, 0 to 2 percent slopes, but it is silty clay loam throughout the profile. It occurs on flood plains and valley floors in the larger valleys and along the larger drainageways. In color, this soil ranges from grayish brown to dark grayish brown. The substratum is stratified and in places ranges from light clay loam to loamy sand. In a few areas 10 percent of the solum, by volume, is fine and medium gravel. Available water holding capacity is about 10 to 12 inches. Permeability is moderately slow.

APPROVAL

I hereby certify that the attached General Plan Element for the City of Hollister, California was duly and regularly approved by Resolution No. 76-8 of the Planning Commission of the City of Hollister on the 27th day of May, 1976.

s/ Larry Nicholson
Chairman of the Planning Commission
of the City of Hollister

ATTEST:

s/ Thomas E. Barry
Secretary of the Planning Commission
of the City of Hollister

ADOPTION

I hereby certify that the attached General Plan Element for the City of Hollister, California was duly and regularly adopted by Resolution No. 76-64 of the City Council of the City of Hollister on the 26th day of October, 1976.

s/ Alfred Ledford
Mayor of the City of Hollister

ATTEST:

s/ Frank D. Felice
Clerk of the City of Hollister

SAFETY ELEMENT

Table of Contents

Foreword. This Safety Element of the Hollister General Plan covers all those procedures which have been developed to protect the lives and property of the citizens of the area before, during and after a disaster occurs.

The Safety Element differs from all the other elements of the General Plan in that there is no separation of information between the city limits and the planning area. Safety planning is County-wide and all governmental units are formed into a single unit for this purpose.

Section 65302 (i) of the Government Code of California requires that the City adopt a "Safety Element for the protection of the community from fires and geologic hazards including features necessary for such protection as evacuation routes, peak load water supply requirements, minimum road widths, clearances around structures, and geologic hazard mapping in areas of known geologic hazards."

The matter of minimum road widths is covered in the Circulation Element of this plan and is not repeated here. Clearances around structures are covered in a number of sections of the City Zoning Ordinance which is to be revised after the adoption of this General Plan and therefore this subject is not included.

The requirement for geologic hazard mapping is covered in complete detail in the Seismic Safety Element.

Disaster Planning. All counties in California are a part of a state-wide network covered by the California Civil Defense Disaster Plan. Under this plan the state is divided into six regions. San Benito County is a part of Region 2, a group of fourteen counties which are primarily along the coastline. The other counties in Region 2 are Alameda, Contra Costa, Del Norte, Lake, Marin, Mendocino, Monterey,Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano and Sonoma.

The state is a part of a nationwide network which is controlled from a disaster center in Colorado Springs, Colorado.

Disaster planning for the state is under the jurisdiction of the Office of Emergency Services which is located in Sacramento. Each county must have the approval of this office for its plan. San Benito County's plan was approved on November 2, 1971 and on December 20, 1971 the Board of Supervisors adopted the plan by resolution. Each county plan must be reviewed and brought up-to-date at two year intervals.

Hollister is a part of this state-wide network by virtue of its mutual agreement with San Benito County to take part in the plan.

The City's Plan identifies foreseeable organizational requirements, tasks, resource requirements, and basic procedures for the conduct of emergency operations. Nonessential governmental and private activities may be reduced or stopped, depending upon emergency conditions.

The county emergency organization may conduct designated emergency operations inside the limits of a city, by mutual agreement.

Many privately owned resources are available for use during emergencies. Arrangements have been made to make maximum effective use of these materials and personnel resources.

Mutual Aid. Mutual aid, including personnel, supplies, and equipment, will be provided and/or utilized in accordance with the California Master Mutual Aid Agreement. Mutual aid will be requested through established channels.

The city emergency organization will support and be supported by:

(1) Emergency organizations of other cities within the county and the county;

(2) The State of California emergency organization; and

(3) Federal agencies.

Personnel and resources of all special districts and public utilities have been incorporated into the city emergency organization.

Businesses and industries having personnel and resources needed to meet emergency requirements have been incorporated into the city emergency organization.

Military assistance will complement but not substitute for civil government emergency operations. All requests for military support will be directed through the State Office of Emergency Services.

Interjurisdictional operations and mutual aid within the county area will be coordinated by the operational area coordinator.

The City Director of Emergency Services is responsible for arranging, through the chairman of the local Red Cross Chapter, for participation of the Red Cross in the emergency organization to provide food, clothing and housing in case of war-caused emergency, and for the working relationship between the Red Cross and city and county agencies in case of natural disasters and other peacetime emergencies.

Diagrams showing the channels to follow when requesting mutual aid for law enforcement, and fire fighting assistance are on the following pages 5 and 6. On page 7 there is an organizational chart of the fire and rescue services.

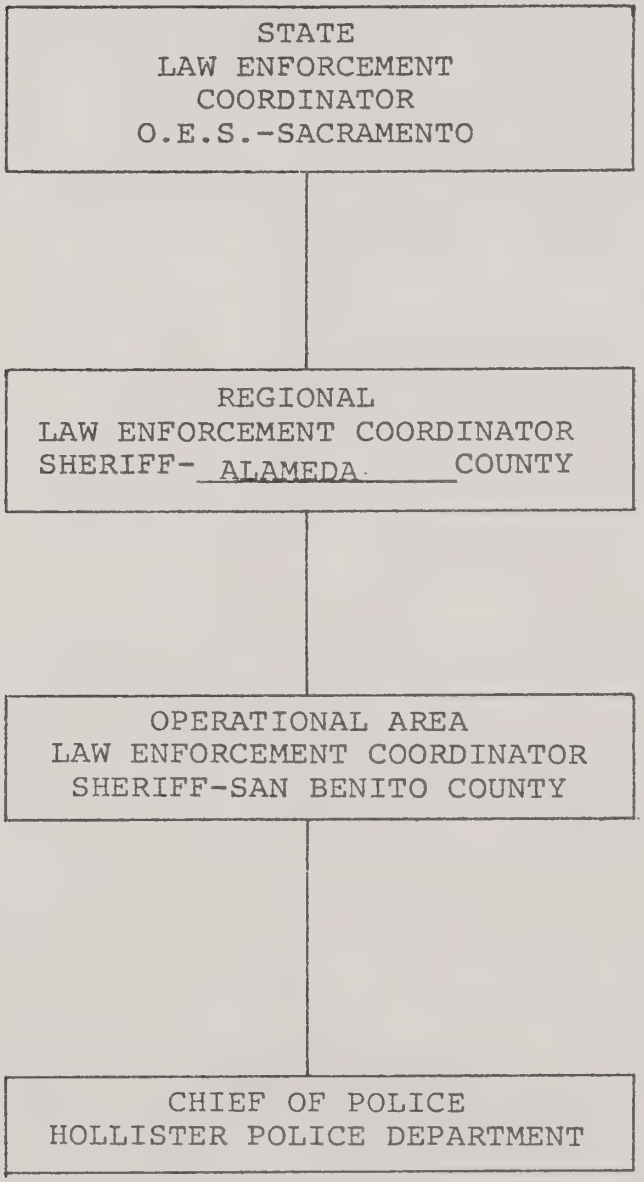
Purpose and Objectives. The purpose of the City of Hollister Emergency Plan is to:

(1) Provide a basis for the conduct and coordination of operations and the management of critical resources during emergencies;

(2) Establish a mutual understanding of the authority, responsibilities, functions, and operations of civil government during emergencies;

(3) Provide a basis for incorporating into the city emergency organization nongovernmental agencies and organizations having resources necessary to meet foreseeable emergency requirements.

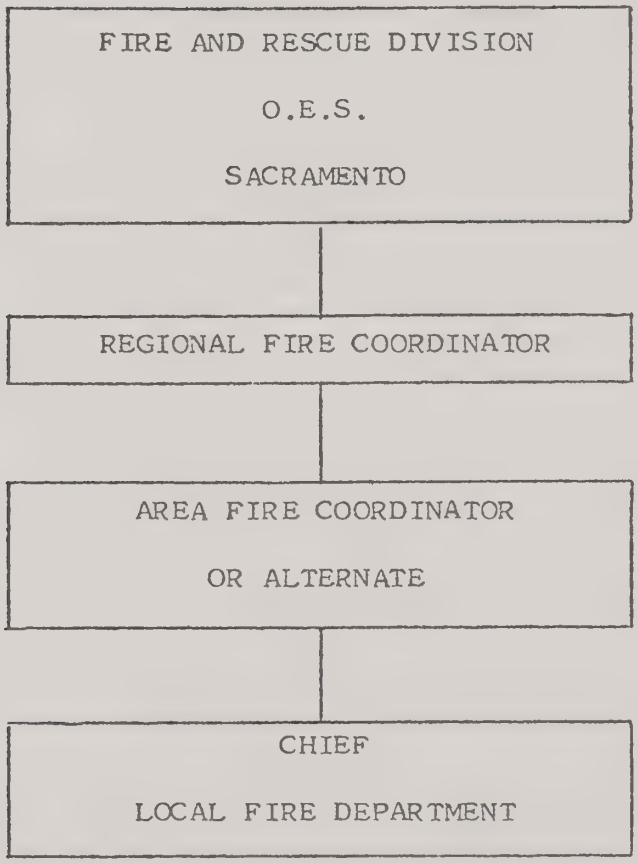
CHANNELS TO FOLLOW WHEN REQUESTING
DAY-TO-DAY MUTUAL AID
LAW ENFORCEMENT ASSISTANCE



CHANNELS TO FOLLOW WHEN REQUESTING

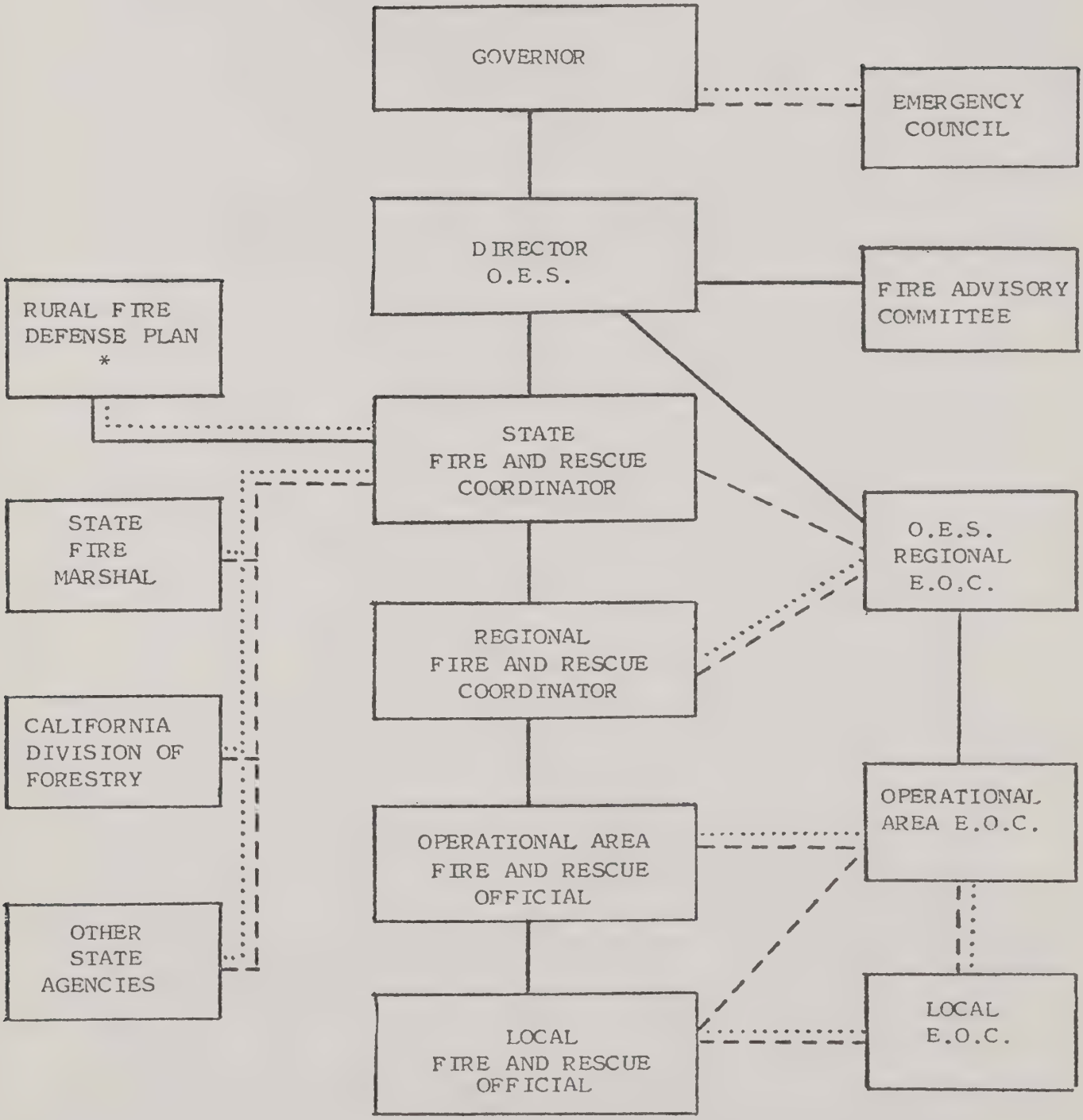
DAY-TO-DAY MUTUAL AID

FIRE FIGHTING ASSISTANCE



ORGANIZATION CHART

FIRE AND RESCUE SERVICES



The City of Hollister Emergency Organization will plan, prepare for, and conduct operations in order to accomplish the following objectives:

(1) Save lives and protect property.

(2) Repair and restore essential systems and services.

(3) Provide a basis for direction and control of emergency operations.

(4) Provide for the protection, use and distribution of remaining resources.

(5) Provide for continuity of government.

(6) Coordinate operations with the emergency service organizations of other jurisdictions.

Activation. The City's Emergency Plan shall become operative automatically by the existence of a State of War Emergency, as defined by the California Emergency Services Act; when the Governor has proclaimed a State of Emergency in an area including the city; or on order of the Mayor or the Director of Emergency Services, provided that the existence of a local emergency has been proclaimed in accordance with the provisions of the Emergency Services Ordinance of this city.

The Director of Emergency Services, who is also the Director of Civil Defense, is authorized to order the mobilization of the city emergency organization or any portion thereof as required to provide for increased readiness in event of the threatened existence of an emergency and prior to the full activation of this plan.

Assumptions. The responsibility for emergency preparedness rests with civil government at all levels. Available warning time, used effectively, will decrease potential life and property loss. Adequate pre-emergency testing of facilities and equipment will ensure reliable functioning. The nature and extent of an emergency will govern which elements of the emergency organization will mobilize and respond.

Operating Center. Emergency Operating Centers (EOCs) are facilities for the centralized direction and control of the emergency organization and the general public. During an Increased Readiness Condition or an Alert Warning, all EOC facilities will be activated and manned to the extent required.

The Chief of each unit of the emergency organization, or his designated representative, and such staff assistants as are assigned will direct and coordinate emergency operations from the primary EOC. Other secondary EOC facilities are manned by personnel from appropriate emergency services or resources management divisions.

The following facilities are scheduled for emergency use:

Name of Facility	User	Communication Systems Status
City Hall (Primary EOC)	Emergency Organization	Limited
Central Fire Station	Fire Service	Complete
Police Administrative Building	Law Enforcement Service	Limited

Organization. Emergency manpower must be obtained from government and private agencies and from skilled individuals and professional groups. Additional manpower is obtained by using volunteers and/or persons impressed into service.

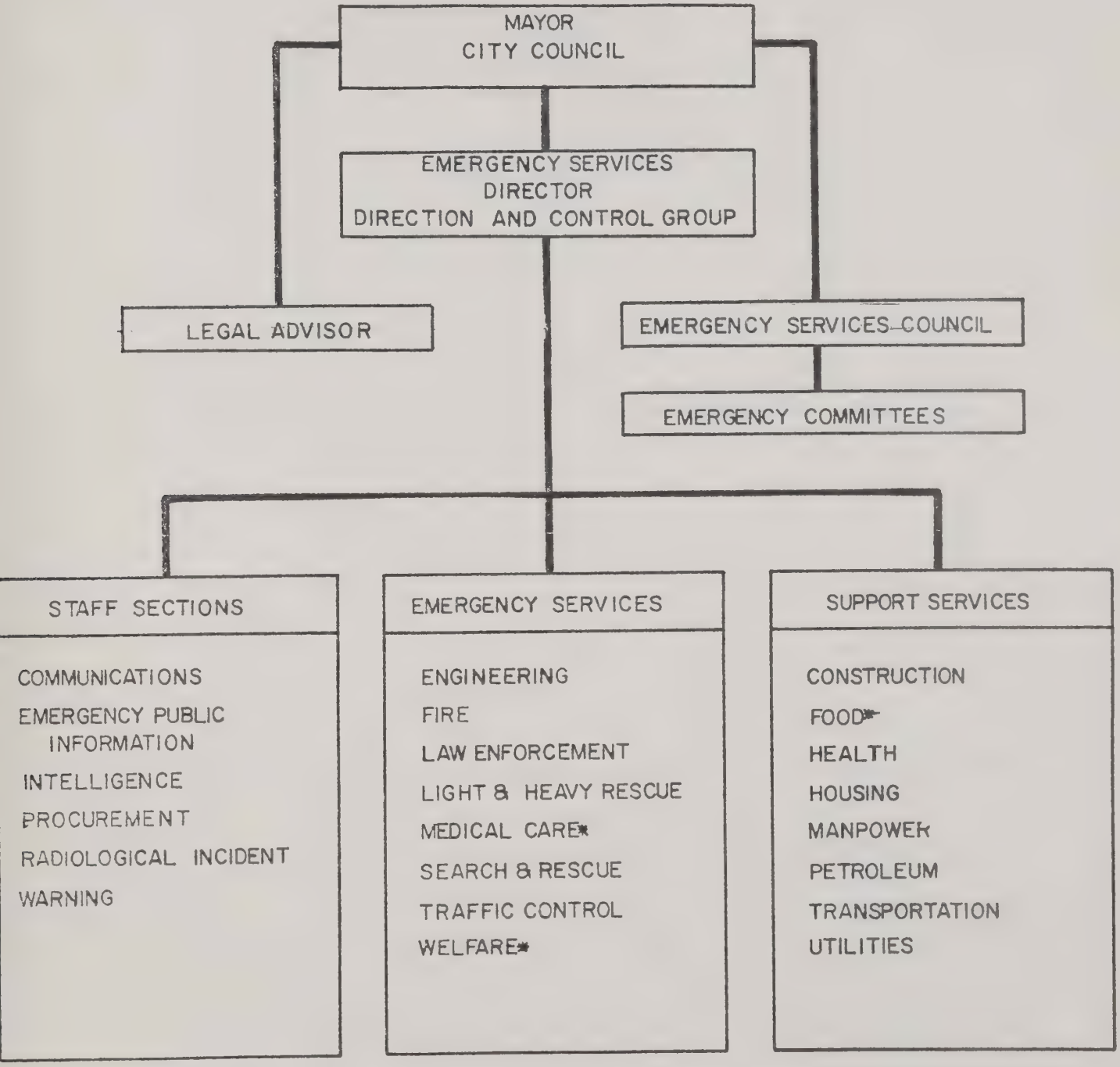
The structure of the emergency organization is based on the following principles: compatibility with that of day-to-day governmental and private organizations; clear lines of authority and channels of communication; simplified functional structure; incorporation into the emergency organization of all available manpower resources having disaster capabilities; and formation of special purpose units having no pre-emergency counterparts to perform those activities peculiar to major emergencies.

The charts on pages 11, 12 and 13 indicate the line of local authority in connection with Peacetime Emergency, War Emergency, and Interjurisdictional Authority in State of Emergency or War Emergency.

The emergency organization sections and services, with responsible officials, are listed on page 14. Each section or service chief is responsible for maintaining an adequately trained staff to perform tasks assigned in this plan.

PEACETIME EMERGENCY ORGANZATION CHART

This chart illustrates the initial city emergency organization formed in response to a locally proclaimed "LOCAL EMERGENCY" or state proclaimed "STATE of EMERGENCY".

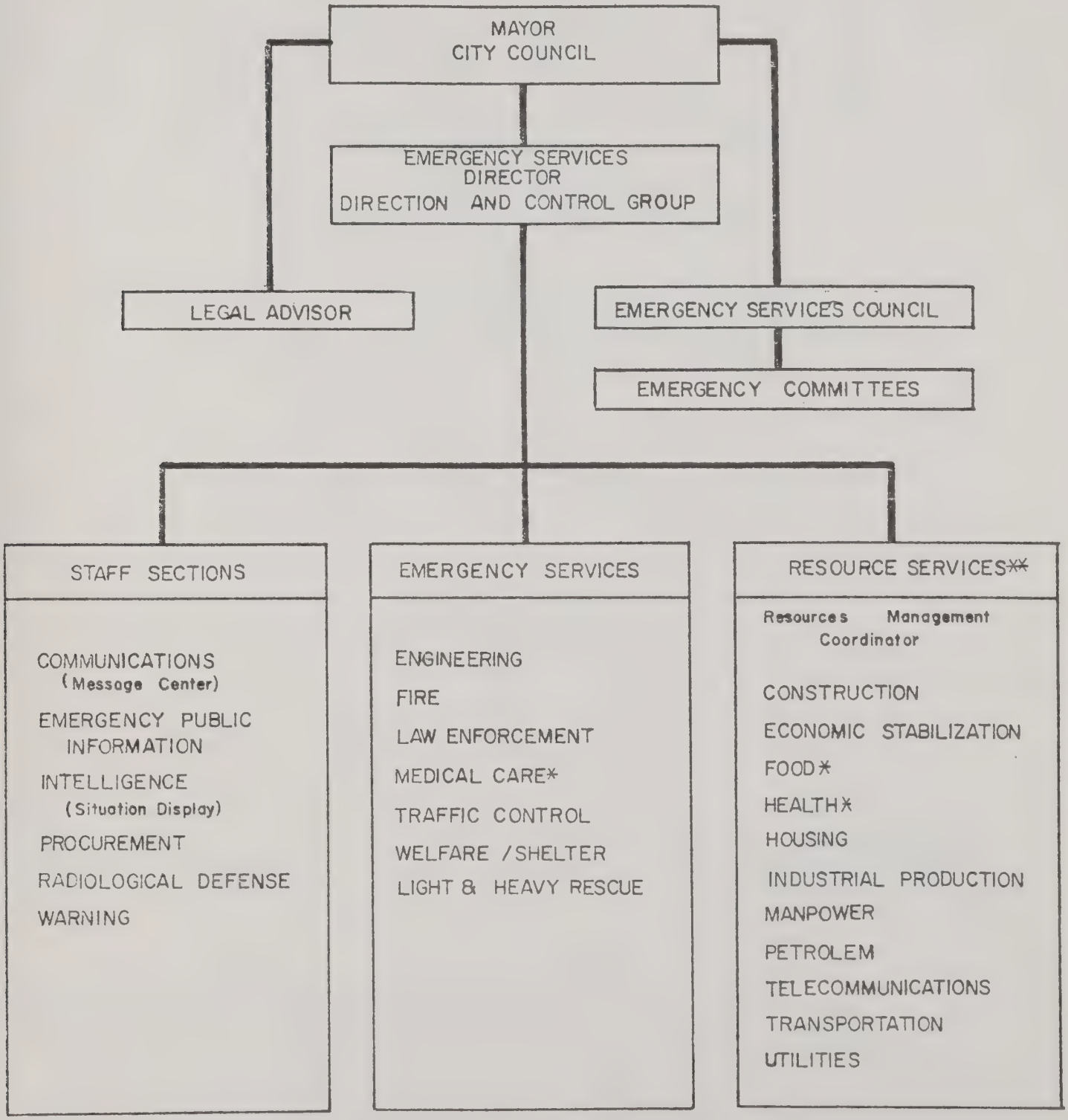


Line of Authority

*County emergency service authorized or contracted to operate within city jurisdiction.

WAR EMERGENCY ORGANIZATION CHART

The magnitude and nature of a war emergency require that city government be realigned in order to more effectively cope with the situation. This chart illustrates the initial realignment of city government in response to a STATE OF WAR EMERGENCY.



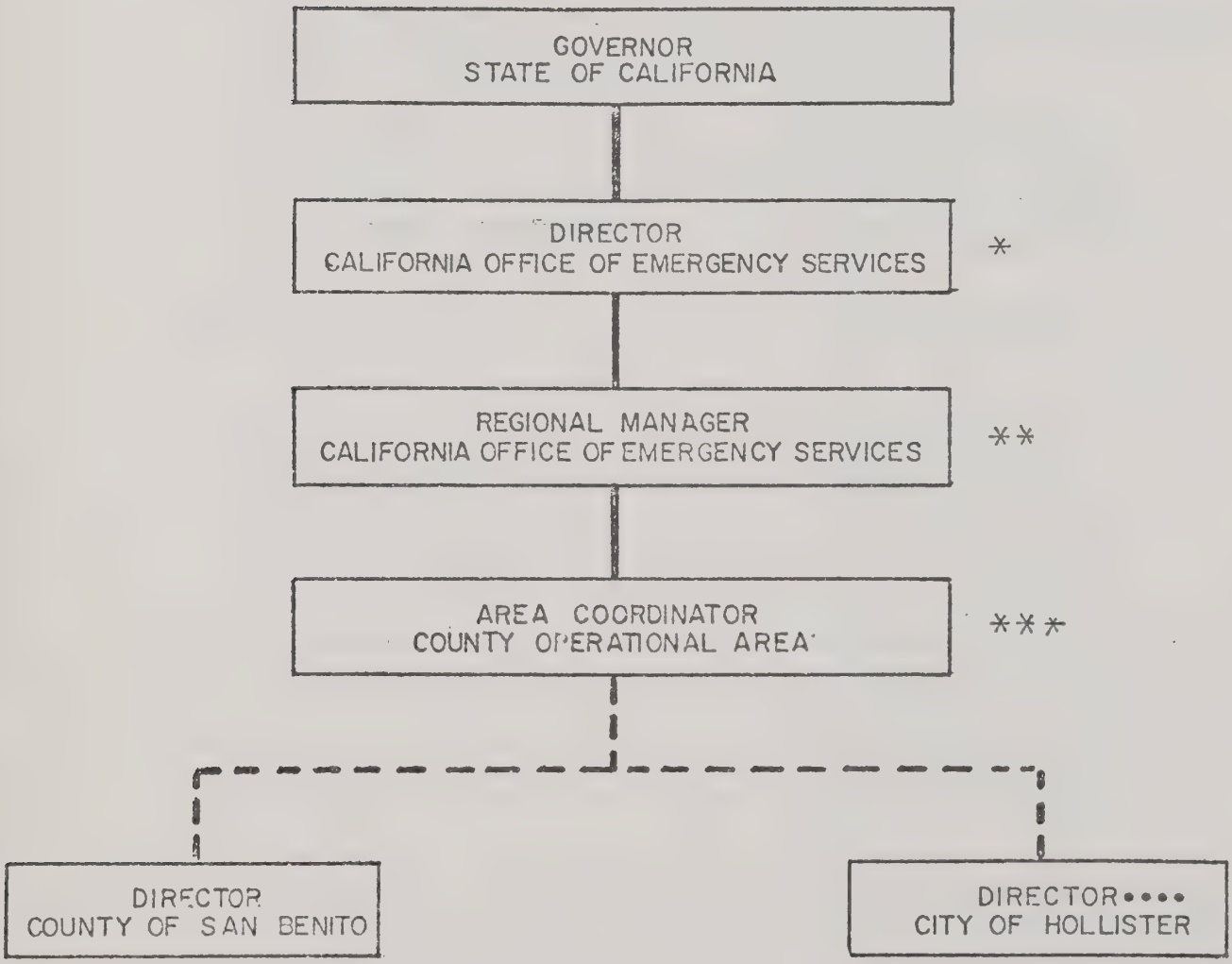
Line of Authority

* County emergency service authorized or contracted to operate within city jurisdiction.

** Member units of the statewide Emergency Resource Management Organization.

INTERJURISDICTIONAL EMERGENCY RELATIONSHIP CHART

State of Emergency or War Emergency



Line of Authority (Direction and Control)

Line of Coordination and Communication may become line of authority by State action.

* Has emergency authority delegated from Governor

** Has emergency authority delegated from Director, OES

*** Has emergency authority derived from a pre-emergency joint powers agreement among member jurisdictions (cities and county), and/or as may be delegated from higher authority Locally optional for peacetime emergencies.

•••• Has emergency authority as provided by local ordinance.

7/75

Staff Sections	Chief of Section
Communications	Supervisor, Communications
Direction and Control	Emergency Services Director
Emergency Public Information	City Clerk
Intelligence	Planning Director
Procurement	Planning Director
Radiological Defense Incident (War Emergency Only)	Officer as appointed by Emergency Services Director
Warning	Chief of Police

Emergency Services	Services Chief
Engineering	City Engr/Street Commissioner
Fire	Fire Chief
Law Enforcement	Chief of Police
Light and Heavy Rescue	Fire Chief
Medical Care	Assigned Physician
Search and Rescue	Chief of Police
Traffic Control	Chief of Police
Welfare/Shelter	Director, Parks & Recreation
Construction	Building Inspector
Food	Agricultural Comm. (County)
Health	County Health Officer
Housing	Building Inspector
Manpower	Personnel Director
Petroleum	Assigned from Industry
Transportation	Traffic Engineer
Utilities	Assigned from Utilities Ind.
Economic Stabilization (War Emergency only)	Appointed by Board of Supervisors
Industrial Production (War Emergency only)	Appointed by Board of Supervisors
Telecommunications (War Emergency only)	Assigned from Telephone Industry

The following auxiliary organizations will provide emergency assistance and support to services as listed below:

Fire	Volunteer Fire Department California Division of Forestry
Law Enforcement	Police Auxiliary
Welfare	Private School Public Schools California National Guard Armory
Engineering	Road Commissioner (County) Flood Control District

The City Engineer is in charge of the section on engineering services. He is prepared to repair and restore highways and bridges, water supply, sewage disposal and handle the clearance of debris.

If additional help should be needed over and above the persons who have been trained, the State Department of Human Resources, working in cooperation with the City Clerk's office, will respond to this need. The Human Resources Department furnishes information as to what persons might be available, and the Clerk handles the recruiting and the compilation of a card file showing what skills a particular individual has.

Disaster Corps. Some years ago action was taken to recruit public spirited citizens in a trained cadre of personnel, to be identified as the San Benito County Disaster Corps. Three divisions were formed to provide communications, rescue and medical self-help services in the event of local emergency and/or disaster. On-call rosters are maintained to indicate business and home telephone numbers, addresses, disaster assignment and radio call signs if applicable. Licensed pilots and boat owners have volunteered their services and aircraft and boats in the event of need. These trained personnel would supplement the public safety agencies in the city.

Training. The Hollister Fire Department provides rescue training to members of the San Benito County Disaster Corps as well as the regular and volunteer members of the Fire Department. The Department has a remodeled van type vehicle which includes every type of equipment which might be used by a rescue service. It is used by various law enforcement agencies to extricate victims trapped in vehicles at the scene of serious automobile accidents.

Radiological Defense Training and Medical Self-Help Training is the responsibility of the Adult Education Department of the San Benito County High School. Training involving communications, earthquake preparation and general orientation of the public is provided by the Civil Defense Division of the Sheriff's Department. Rescue training (heavy and light) is provided by the Hollister Fire Department.

A training facility, funded by the California Council on Criminal Justice and San Benito County, for all law enforcement personnel in the County was constructed approximately two miles north of Hollister on State Route 25 (Bolsa Road) in 1971. Individual and joint unit training is conducted at the site, involving marksmanship, baton, gas and riot/disorder training.

Warning Systems. The warning system is the means for relaying notice of impending or actual attack from the federal government to the public. Regardless of the effectiveness of the warning system, it can do no more than inform. It is the response to warning by the total emergency organization and the public which is important. Appropriate responses and effective use of the warning information may be limited by the amount of time available.

Warning actions are characterized by high priority for a short period of time, the use of mass media systems for passing warning to the public, a small number of workers to man the system, a need for fast activation of the system on short notice, and readiness to repeat all actions in the event of successive alerts or attacks.

The National Warning System (NAWAS) feeds warning information to the State Warning Point. (The statewide warning points also hear the NAWAS information but do not take action from it.) After the State Warning Point transmits the warning condition, the Warning Point activates the Bell and Lights warning system to inform local governments, schools, and industry. Local authorities then inform the public by means of outdoor warning devices, mobile loudspeakers, and other devices.

Upon activation by the President, the Emergency Broadcast System (EBS) will provide warning information to the public.

Warning information is received at the City of Hollister Fire Department, via the Bell and Lights system. Alternate means of receipt are via the California Law Enforcement Telecommunications System (CLETS) and public safety radio systems.

The general public receives warning by means of sirens and horns which are located to provide coverage for an estimated 80 per cent of the peak nighttime population of the city. To the extent possible, the remaining population will be notified by other available means. In addition, the Emergency Broadcast System is expected to provide coverage for a large part of the population.

Notice of warning is also broadcast from the various county and city communications centers to special facilities (schools, hospitals, fire stations, utility stations, etc.). Key workers of emergency organizations are alerted by means of monitor receivers or by telephone.

Warnings are divided into three types: attack warning, fallout warning, and natural disaster warning. An attack warning is a civil defense warning that an actual attack against this country has been detected. The fallout warning is a warning of radiation hazards resulting from nuclear detonation, and a natural disaster warning (NADWARN) concerns tornadoes, hurricanes, floods, fires, and other dangers such as tsunamis (seismic sea waves).

Two standard warning signals have been established. The Attack Warning signal consists of 3- to 5-minute wavering tone on sirens, or short blast on horns or whistles, repeated as often as deemed necessary. The Attention or Alert signal is a 3- to 5-minute steady tone on sirens, horns or whistles, repeated as often as necessary. This signal may be used at the option and on the authority of local governments to provide warnings of an impending peacetime emergency. The Attention or Alert signal will not be sounded until local radio and television stations are prepared to broadcast emergency public information from government authorities. The Attention or Alert signal means an emergency situation exists or is imminent. Listen to your local or area radio or television station for essential emergency information.

Communications Media	Strategic Warning (Readiness Conditions)	Tactical Warning	Attack No Warning	All Clear
Bells and Lights				
EBS, Alert Monitor System, and other voice or printed message systems	Message incl. information, advice, and action instructions	This is an attack warning	This is an attack warning	Voice or printed announcement
Outdoor warning devices (siren, whistle, or horn)	None	Attack Warning Signal	Attack Warning Signal	None

Communication Systems. The communications systems installed at or controlled from the EOC will support the field activities of elements of the emergency organization. Other communication systems provide links to nearby jurisdictions (cities and counties), or to higher levels of the statewide emergency organization. The communications systems at the EOC include radio systems licensed to this jurisdiction. Such radio systems are augmented in an emergency by radio systems licensed to other agencies of government, to private industry, and to individuals.

During a State of War Emergency, privately owned radio systems, equipment, and facilities, subject to approval by the licensee, will generally be used to support the field activities of emergency services not already linked directly to the EOC. All radio equipment will be operated in compliance with FCC rules and regulations.

The Communications section is one of several staff sections which are organized and assigned at the EOC to provide communications for the direction and control of emergency operations. Messages directed outside of the EOC are handled by communications operators in this staff section.

The message center processes and distributes messages within the EOC. The EOC communications and message staff is supervised by the Communications Officer, who also has technical supervision of emergency service technicians who service or operate communications equipment in the field.

Operators to man the EOC communications equipment will be provided by those agencies regularly using these systems. The Communications Officer will provide for operators of other communications equipment which augments regular capabilities, and will also provide for personnel to service and maintain communications equipment and facilities.

Radio systems subject to city control will be used for message transactions according to the following table, subject to such revisions as may be issued by the Communications Officer. Operators of radio equipment will provide service in accordance with this table or revisions as issued.

Radio System

Police	Law Enforcement*
Fire	Fire*
Local Government	Engineer*
	Procurement
	Manpower
	Transportation
RACES (1)	Medical
Citizens Band (2)	Health
	Shelter/Welfare
Industrial	Engineer
	Transportation*

Emergency information, advice, and action instructions are announced to the public by various media. The EBS and outdoor warning devices are the primary media. Other media are the mobile loudspeakers, bulletins, handbills, and the press. The Emergency Information Officer will release all emergency public information originated by the city.

Priorities and message classifications are as follows: emergency messages, highest priority; operational priority, second priority; priority messages, third priority; and routine messages, lowest priority.

Each message will be classified by the originator and a priority assigned in accordance with the above list and/or rules issued by the Director or the Communications Officer.

---

*An emergency service which will provide its own radio operators.

(1) RACES could be assigned to Health and Medical but should be available to back up any of the services in case regular communications paths become inoperative.

(2) Section 95.121 of FCC rules and regulations permits a licensee of a Citizens Band radio station to participate in civil defense activities providing the operation shall be on a voluntary basis; and such communications are conducted under the direction of civil defense authorities.

An inventory of communications systems linked to the EOC include the following:

Police radio (base station and mobiles)*
City fire radio (base station and mobiles)*
Citizens Band radio (base stations and mobiles)*
County-city law enforcement radio (base station)**
Department of Justice CLETS (hardcopy wire) (County)
Commercial telephone

Radio systems subject to government control and use, but not linked to the EOC, include industrial, contractor, trucking, taxi, bus (including school bus), veterinary, medical, ambulance, hospital, railroad, etc; RACES radio; Citizens Band equipment and operators, as well as the regular telephone system.

Emergency Broadcast System (EBS) stations serving the Hollister area are KSCO, 1080 Kilocycles (KCS); KTOM, 1380 KCS; KMBY, 1240 KCS; and KOMY, 1340 KCS. These stations will continue to broadcast on regular assigned frequencies during a War Emergency, but will broadcast area identification instead of their call letter identification. Listeners will be advised to monitor those stations which serve the area in which they are located.

Program entry point for this area is Monterey Bay Operational Area (EBS). Emergency information will be routed to the program entry point through the San Benito County Operational Area Coordinator (San Benito County EOC) by commercial telephone or existing radio facilities.

---

*City owned and licensed radio station
**Non-city-owned or licensed radio system.

Hospitals. The major hospital facility available is the Hazel Hawkins Hospital which has a total of 115 beds. There are two convalescent homes in the city, but since they are fairly well filled at all times, they offer little possibility for use in a disaster.

In 1968 the United States Government gave San Benito County a 200-bed disaster hospital which is stored in sealed containers at Bolado Park. Every facility needed for hospital treatment is included such as beds, operating room and equipment, linen, medicines and the like.

The plan is to set up the 200-bed hospital in the Parish Hall of Sacred Heart Church. If this should prove unworkable because of the destruction of the building a second choice is the Veteran's Memorial Building. If that should not be feasible then it would be set up at Bolado Park. However it is thought more reasonable to have the hospital close to the victims rather than to carry the victims out to the park.

One deficiency in this plan is the fact that there is no way in which local personnel can practice setting up the hospital equipment. It is all in hermetically sealed containers and these cannot be opened unless there is an actual disaster. Detailed instructions, together with photographs and diagrams, are contained in manuals which accompany the equipment but this is not a good substitute for actual practice.

The problem of keeping an adequate supply of drugs on hand because of their rate of deterioration has been solved by a cooperative effort between the Federal Government, which furnishes the drugs, and the Hazel Hawkins Hospital. The Government furnished a 30-day supply of drugs to the hospital, which uses them in the normal operation of its business. Thus, every thirty days the drug supply is replenished assuring that fresh ones will be on hand in case of a disaster.

Emergency Shelters. Radiological and nuclear defense is the responsibility of the science department at San Benito High School. There are five government licensed shelters from nuclear attack in San Benito County.

1. The New Idria Mines are licensed for 20,000 people. However they are only stocked with supplies for 45 people.

2. The basement of the San Benito High School is licensed for 225 and is stocked for 225.

3. The basement of the San Benito County Jail is licensed for 90 and stocked for that number.

4. The basement in a building at the Keystone Seed Company is licensed for 60 and is stocked for 60.

5. A basement at Ideal Cement Company is licensed for 54 and stocked for 54.

Evacuation Plans. The policy of having mapped evacuation routes has been abandoned by the Federal Government. This has been done in the belief that the panic and confusion which results from evacuation attempts is probably a greater hazard than the danger from the disaster itself. Because of this federal rule the city has no designated evacuation routes.

Continuity of Government. The City Council has provided for the preservation of city government in the event of a war-caused emergency. The Council may designate standby officers to reconstitute itself in the event of war-caused vacancies.

A successor to the position of Director of Emergency Services is appointed by the City Council. Should the Director be unable to serve, individuals who hold permanent appointments to the following positions in government will automatically serve as Acting Director, in the order shown, and serve until a successor has been appointed by the Council and has been seated. An individual serving as Acting Director shall have the authority and powers of the Director.

Police Chief	First Alternate
Fire Chief	Second Alternate
Director of Public Works	Third Alternate
City Clerk	Fourth Alternate

The alternates to key position in the regular departments and agencies of government, or of business and industry, are shown in executive or administrative orders (or the equivalent) issued by department or agency authorities.

Temporary Seat of Government. The temporary seat of government in event the normal location is not available because of emergency conditions will be as follows:

Memorial Auditorium	First Alternate
County Court House	Second Alternate
High School Auditorium	Third Alternate

Water Supply. Water supply for the city is from five wells. There are two 2,000,000 gallon reservoirs supplied by these wells. The city fire fighting capacity is rated at 10 hours sustained water pressure without the use of the wells.

Building Fire Safety. Safety from fire in public buildings almost all of which are of frame construction has been a source of concern to those associated with disaster problems. The owners of such buildings have been urged to take steps to make them safer, and in many instances this has been accomplished.

For example, the Hazel Hawkins Hospital has been completely sprinklered. Other buildings have had emergency exits installed, doors widened and similar remedial steps have been taken. For a number of years the City has operated under the provisions of the Uniform Building, Plumbing and Electrical Codes so that newer buildings have the required safety devices. There is a long term program to require buildings which were not built under the Codes to be brought up to those regulations.

Conclusion. From the foregoing it can be concluded that public safety in the City of Hollister with respect to any major disaster has been prepared for to the fullest extent possible. Safety activities are an ongoing, continuous project which is reviewed and updated at two year intervals.

Continuous training is a requirement for all professionals and volunteers under the direction of a salaried employee who devotes the amount of time required to the activities as a part of his regular duties.

There is continuous coordination with the State Office of Emergency Services.

APPROVAL

I hereby certify that the attached General Plan Element for the City of Hollister, California was duly and regularly approved by Resolution No. 76-10 of the Planning Commission of the City of Hollister on the 22nd day of July, 1976.

s/ Larry Nicholson
Chairman of the Planning Commission
of the City of Hollister

ATTEST:

s/ Thomas E. Barry
Secretary of the Planning Commission
of the City of Hollister

ADOPTION

I hereby certify that the attached General Plan Element for the City of Hollister, California was duly and regularly adopted by Resolution No. 76-64 of the City Council of the City of Hollister on the 26th day of October, 1976.

s/ Alfred Ledford
Mayor of the City of Hollister

ATTEST:

s/ Frank D. Felice
Clerk of the City of Hollister